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CONTENTS

WEST EUROPE

SCIENCE & TECHNOLOGY POLICY

CORPORATE ALLIANCES

CORPORATE STRATEGIES

EAST-WEST RELATIONS

EUROPE-ASIA RELATIONS

SCIENCE & TECHNOLOGY POLICY

France: Efficiency of Environmental Industry Analyzed

BR2704120393 Paris INDUSTRIES in French Mar 93 pp 6-9

[Unsigned article: "Boom in 'Green' Industry: Banking on Innovation"]

[Text] With the world market for "green" industries booming, France has numerous assets which will allow it to benefit from the ecological trend. According to the Pecqueur report by the Economic and Social Council, over the next eight years France will consolidate its position as Europe's second ranking industrial nation with sales of around 90 billion French francs [Fr]. The government is paying extremely close attention to these major economic interests and is seeking to raise its technological level in various sectors, especially in waste processing.

Gone are the days when companies viewed standards as nothing more than a constraint imposed by the public authorities. Today the ideal of environmental protection has given rise to an entire range of industrial activity. In 1991, the "green" industries—namely those companies producing or supplying services for measuring, preventing, limiting, or correcting damage to the environment—had sales worth more than Fr86 billion in France.

Players of Sufficient Size

France's main "green" industry strength is water purification. In 1991, this market accounted for more than Fr41 billion, a figure close to half the entire French budget for the environment! And the two main corporations, the General Water Company (CGE) and the Lyonnaise des Eaux-Dumez [Lyon Water Company-Dumez], are world leaders. Their research budgets far exceed those of their rivals. As for drinking water, the CGE has set itself a challenging goal: to eliminate organic matter, micropollutants, and chlorine using a procedure that combines the use of filtering membranes (a process called nanofiltration) and ozone-based purification. For the first time ever in the world, filtered river water will be drinkable without any addition of chlorine. A pilot station is currently being tested near Auvers-sur-Oise. The Lyonnaise des Eaux, meanwhile, has developed its own membranes for use in aqua-shock equipment. These filters enable a site to be supplied with drinking water taken from rivers. The company is also working on general network management. But these two giants in the field are concentrating mainly on developing their purification activities in order to further the growth of their subsidiaries, namely Degremont for the Lyonnaise and OTV for the CGE. Both concerns should benefit in this sector from the implementation of European directives adopted in 1991, and from the French Water Act of 3 January 1992, which rendered the processing of rain water obligatory. So, priority is being given to high-technology purification plants which differ from their predecessors in terms of their capacity and very low nuisance [nuisances] level.

French industry is not only prominent in the water sector, but is also recognized for its competence in waste processing. In companies like CGE, the Lyonnaise des Eaux-Dumez, Saur, and EMC Services, France has players of sufficient size to face up to international competition. Admittedly, household waste recycling should be rationalized and made more professional, but the performance of the country in this respect is within the European average. Nevertheless, the reprocessing of industrial residues remains a delicate issue. Under current legislation, by 2002, category-1 garbage dumps (dealing with toxic products) will only accept final waste which has been reduced to the smallest possible volume and neutralized. However, although French technical research into the various neutralization technologies is relatively advanced, the industrial groups still need support to meet their future obligations. Since France took over the presidency of EUREKA (innovative technologies program), it has launched a major research program (see box) aimed at encouraging research into waste processing. The Lyonnaise des Eaux-Dumez and Rhone-Poulenc are strengthening their cooperation to develop incineration processes for industrial sludge originating in part from the chemical industry. EDF [French Electricity Company] and its Turu subsidiary have looked into the possibility of plasma torch incineration (neutralization using an electric arc), and the boiler-maker Stein, a subsidiary of GEC-Alsthom, has developed a vitrification process which detoxifies industrial and hospital waste. In all, something like 10 new projects will be given official EUREKA status at the next ministerial conference in Paris in June.

Although technically competent in the waste sector, French companies lag behind in the "green" air-processing industry. Having made a slow start, they have to play the innovation card to win a market share. The reason for this is French legislation on air pollution, which, for many years, was limited to eliminating industrial dust. The result is outdated equipment (five times worse than that used in the German Laender formerly belonging to the German Democratic Republic), which is affecting national industries today. However, many companies have successfully proven their competence in specific niches. Lab, for instance, a Lyon-based company which has developed a wet gas scrubbing and dedusting system used by waste incineration centers. This company has become France's largest exporter of air-processing equipment and recently equipped the incineration unit in Amsterdam West. In the steel sector, the Neu plants in Marcq-en-Baroeul have distinguished themselves with the anti-pollutant equipment for Dunkirk's reactor 4 and the earthy alloy furnaces in Spremberg, Germany. Mention should also be made of Procedair, the dry gas purification specialists (using

fluoride and hydrochloric acid) and Speic, Sarp Industries, Onyx, and the Compagnie Generale de la Chauffe [General Heating Company], which are developing dechlorination procedures.

Limited Range of Equipment

In order to retain its second position in Europe in the environmental sector, France will also have to expand the range of equipment it manufactures. In this respect, the limited range of French goods is worrying, as the Pecqueur report rightly emphasized, and its conclusions were repeated by the Environmental Committee of the XI Plan. In the production of collecting equipment, garbage sorting machines, furnaces, or sensors, the European market is dominated by non-French groups including large numbers of German companies, whose patents equip incinerators in particular. The Industry and Foreign Trade Ministry has just commissioned a report on this subject from Philippe Brogniart, president of the FNADE [National Federation of Waste and Environmental Industries]. He would also like to strengthen independent engineering services because, although the services of the Construction and Public Works and Environment Ministries satisfactorily meet general demand, it appears that international finance organizations now prefer independent consultancies, which are considered better able to organize competition between manufacturers. A study by SRI for the Ministry of Industry showed that the strength of German production lay in its greater concentration on process engineering and in its specialist companies. Degremont has fully realized this, hence its involvement of the Safege company earlier in the production process.

Technology dissemination is another favorite access route to the marketplace. The technical centers (CTI's), which are responsible for promoting technology dissemination and transfer, have been investing in the environment for several years. Five of the 11 dossiers qualifying for support in 1992 were in this field. The technical paper center, for instance, has invested in bleaching (work on chlorine-free processes), paper recycling, water effluents, and residual pulp (balance sheets and factory audits, definitions, analyzing traces of chlorinated components). However, such examples remain too few and far between. Many companies prefer to keep their anti-pollution methods secret out of fear of being copied. Overall, French engineering does not play a sufficiently large role in technology transfer.

Key Role of Technology

Nevertheless, the importance for companies working in this market to adapt to technological solutions is clearly demonstrated in a study completed by SESSI [Research Service for Industrial Strategies and Statistics]. "Continual monitoring and innovation are crucial for launching products and services in a burgeoning market, largely ruled by legislation. Close to 60 percent of "green" industries say they have launched new products, with small companies being scarcely less active than big ones," points out Myriam Julia and Michele Falco. Even more astonishing is the fact that half of all "green" companies affirm that they are engaged in research and development.

The availability of leading-edge technology serving the largest possible market will be a major strength. This is the final conclusion reached by all the players involved: companies, local authorities, and public services. Technological leadership is a decisive factor in competitiveness and provides some influence over the adoption of European standards. It is therefore very clearly a market-creating element.

Well-Placed to Influence Water Legislation

In this field the least hesitation can have expensive consequences. This is how France let the catalytic convertor market get away, to the disadvantage of the clean engine defended by its own car manufacturers. By contrast, French industrialists skillfully negotiated the race for CFC substitutes and today are well placed to stamp their mark on water legislation. The advanced technology of the purification plants developed by French industrial companies raises the level of European standards. Giant French "green" companies could also influence both hot (vitrification) and cold neutralization processes. The latter technology is supported by the CGE and the Lyonnaise des Eaux and uses hydraulic coagulants and additives that react with water to trap and mix liquid and muddy waste. At present, the technology is well ahead of the competition, a significant advantage from the point of view of new waste legislation!

The availability of advanced technology satisfying the largest possible market will be a significant advantage, because all environmental sectors, whether large or small, will be the subject of a fierce struggle throughout the world. The key element is mastering the market of ecological products which respect the environment "from the cradle to the grave." This is a struggle which requires a serious ability to anticipate opportunities and seize them whenever they arise.

[Box, p 7] EUREKA

EUREKA is convinced of the potential of European waste management. The European cooperative program, presided over by France until June, is emphasizing environmental aspects, particularly waste research. Every year EUREKA labels and financial support is granted to innovative industrial projects originating from at least two different countries. The objective is to produce a commercial product, process, or service. More than 600 projects have been funded in this way, and 455 French companies have participated in the program. Until recently, industrialists seemed somehow to be shunning the waste market. By now, several research and development programs uniting French waste groups with European partners have already gained EUREKA's support. Examples include the following:

INTEC

Piloted by the General Water Company [CGE], this ambitious program worth Fr475 million aims to develop the full range of technical tools necessary for a total waste management service. The solution for each material depends on the local context. "In medium-sized towns in rural regions, the sludge from purification stations is recycled easily as fertilizer, but wanting to see compost in Parisian garbage cans seems aberrant to me," explains Michel Dutang, waste manager at CGE. For that reason, the program covers a vast technological range: 35 subprograms covering collecting, sorting, recycling, thermal processing of normal waste, specific processing, neutralization, process residue storage, and finally factory management and optimization. Adopted by EUREKA in 1992, INTEC comprises 13 partners including six non-French companies.

SITINERT

Led by SITA, a subsidiary of the Lyonnaise des Eaux-Dumez group, the SITINERT program seeks to develop new stabilization and solidification processes for the final residues of special industrial wastes. It is also planning to design a new final residue storage system. Its budget totals Fr90 million. Flying the EUREKA flag since 1992, SITINERT comprises nine partners, three of them being non-French.

[Box, p 8] Ministry of Industry Invests in Research

Since 1989 major investments have been made in environmental research and development. Growing continually, these investments already exceed Fr300 million.

The main areas selected to receive funding are as follows (1992):

Areas	Total Amount (MFr)	Subsidy (MFr)	Subsidy Percentage
Clean, energy-efficient automobiles	218.80	85.90	27.76%
Electric automobiles	161.00	40.30	13.02%
Automobile frames	130.80	33.95	10.97%
Other clean products	97.60	39.30	12.70%
Clean technologies	70.00	22.90	7.40%
Water	247.10	51.80	16.74%
Waste	108.80	35.30	11.41%
TOTAL	**1,034.10**	**309.45**	**100.00%**

Waste is the latest addition to the list; this topic has also been adopted as priority program under EUREKA.

Note the large share of automobile-related sectors in the environmental field: the "clean, energy-efficient automobiles," "electric automobiles", and "automobile frames"—areas worth a total of Fr160 million alone, i.e., 52 percent of all environmental aid awarded by the ministry.

Mention should also be made of the significant activity of the industrial technical centers.

Germany: BMFT Funds Environment-Friendly Pulp Production Process

MI0405093293 Bonn BMFT JOURNAL in German Mar 93 p 14

[Text] The first production facility in the world operating the organocellular method of pulp production has gone on line in Kelheim (Bavaria). Development of the environment-friendly, pioneering process has been funded to the tune of 18 million German marks [DM] by the BMFT [Federal Ministry of Research and Technology] over a period of 10 years. Its conversion into a large-scale industrial plant with an annual capacity of 150,000 tonnes is being funded solely by Bavarian Pulp GmbH, which is investing DM520 million, thereby creating 250 skilled jobs. The BMFT funding has therefore achieved its objective in all respects.

The main feature of the organocellular development is that it uses no sulfur at all. The pulp produced by this method has strength properties far in excess of those produced by the sulfite and sulfate processes that are prevalent worldwide. Because sulfur is not used, lignin and hemicellulose, the other two main components of wood, which is a renewable raw material, can be further processed.

France: Breakdown of ANVAR Agency's 1992 Technology Subsidies

BR0405151993 Paris INDUSTRIES in French Mar 93 p 5

[Article signed M.C.: "National Agency for the Implementation of Research, Europe, and Youth"]

[Text] With 1.54 billion French francs [Fr] allocated to support innovation and 3,470 grants awarded, the National Agency for the Implementation of Research (ANVAR) in 1992 gave priority to European partnerships, measures on behalf of youth and innovation, and aid to industrial conversion zones.

"Last year, businesses made massive cuts in their investments, but maintained their research and development spending, which is new," stressed Henri Guillaume, the French agency's CEO, during a press conference. This year, Guillaume is also president of the EUREKA (European Program for High-Technology Research and Development) program's high-level group. Aid to develop new

products and processes still represented the core of ANVAR's activities in 1992 (1,587 subsidies worth Fr1,172 million, compared with 1,636 subsidies and Fr1,095 million in 1991). The average amount of each grant is Fr1 million. The SMIs [small- and medium-sized industries] were the priority targets (67.5 percent), but the agency wants to intensify its action in favor of "medium-sized" companies, which are capable of developing more ambitious projects. Above all, ANVAR wants to support young companies no more than three years old, which received 32 percent of all grants worth Fr608 million.

Grants to European technological partnerships increased from 49 grants in 1991 to 109 grants in 1992, totalling Fr47.4 million. Approximately 30 percent of these projects are estimated to have resulted in EUREKA projects.

Last year, ANVAR was also entrusted with the management of the STRIDE program (Fr113 million), which seeks to raise the technology level of industrial conversion zones.

In addition, in 1992, 584 grants totaling Fr13.6 million were allocated to young researchers. These grants enabled students from universities, colleges, and engineering schools to team up with local industrial partners. More than half of these projects have already produced tangible results: the establishment of new companies, patents, traineeships, and jobs.

Grants aimed at technology transfers increased from 164 in 1991 (Fr92.3 million) to 203 in 1992 (Fr120.5 million).

Finally, ANVAR's experience "in the field" enabled it to develop a specific activity: "innovation engineering," which consists in providing pertinent advice to innovating companies.

France: CNRS, Universities Sign Cooperation Agreement

93WS0399C Paris AFP SCIENCES in French 25 Mar 93 p 1

[Text] Paris—A communique has announced the signing of an agreement protocol "to redefine and step up relations between the CNRS and establishments of higher education" on 19 March in Paris.

The document was signed by Messrs. Francois Kourilsky, the general director of the National Center for Scientific Research (CNRS), Jean Giraud, director of research and doctoral studies, and establishments of higher education, who were represented by Georges Haddad, first vice-president of the University Presidents Conference.

For the CNRS, the agreement is the outcome of an attempt to revise its relations with universities, a move that was made necessary by changes in the latter and in the CNRS. Its general director, assisted by Professor Guy Ourisson, began the makeover in March 1992. University establishments are the CNRS's foremost partners: Nearly two-thirds of the 1,360 laboratories with ties to the CNRS are university labs.

For DRED, the agreement is a form of recognition and the outcome of protracted work to establish a sweeping contracts plan with schools of higher education. The fact that the universities have signed such an agreement for the first time on a national level amounts to a confirmation of their autonomy and highlights the importance they attach to their relations with the CNRS.

The agreement primarily concerns two aspects of relations between the CNRS and higher education: exchanges of personnel, expertise, and experience between the research and teaching worlds; and changes in the organizations that oversee the partners' team efforts.

Nationally, coordination between DRED and CNRS assessment and decisionmaking bodies will be stepped up. Researchers will be encouraged to transfer to positions in higher education, and reciprocally, more teacher-researchers will be assigned to the CNRS. Researchers will be encouraged to participate in teaching at all levels, and their role in university bodies will be strengthened.

Partners will be able to negotiate jointly-agreed-upon changes in how they collaborate, notably through the creation or extension of different categories of laboratories. They will gradually experiment with new forms of combining laboratories or contracting for research. Specific agreements will make it possible for the CNRS and universities to share personnel.

Greater collaboration between partners will be sought, notably in the areas of corporate relations, international relations, training, human resources, and organizing information and management systems.

Over the next few months, the CNRS and each establishment will sign agreements, sought by DRED, that will take into account the specifics of each setting. Regional CNRS delegates will be responsible for drafting these agreements in cooperation with university presidents.

FRG: Loss of Competitiveness in High Tech Areas Seen

Industrialists on Research Policy

93WS0434A Berlin ING DIGEST in German Apr 93 pp 14-17

[Article by Guenther Ludvik: "The Image Crumbles"; first paragraph is ING DIGEST introduction]

[Text] Germany is tops—at technologies from the past century. The technological competitiveness is disappearing, warn managers and politicians. "We have become too proud, too satisfied. We have problems recognizing the seriousness of the situation," says General Motors top executive Louis R. Hughes, referring to Germany. Research chiefs disagree: In large corporations and at

medium-sized companies, engineers are working on new technologies and top products. Just how successfully will be shown at the Hannover Fair.

Siemens researchers are celebrating a new world record these days: They have built the fastest integrated circuit in the world, they boast. The tiny silicon disc can process 40 billion bits per second. "What generates headlines as a laboratory experiment will not be a market-relevant technology for a long time," Siemens board member Prof. Hans-Juergen Danielmeyer mutes the euphoria. But the world record signals the capability of being able to keep up with the world's top field even in the future. This is also true in the area of telecommunications—still, the pessimists add.

In most of the future technologies, whether new processing materials or genetics, electronic controls, environmental protection or space flight, Germany threatens to slip behind the United States and Japan, warns the minister-president of Baden-Wuerttemberg, Erwin Teufel. The politician from FRG's model land finds that "the present economic slump is not particularly worrisome, but instead the structural crisis in which the German economy finds itself." His criticism is that Germany "is tops in technologies which were developed in the last century."

It might be true: The automobile builders and steel producers are faced by the most serious cuts. The largest branch of industry in western Germany, machine-building and plant construction, is mired in the most persistent recession of the postwar era. In 1992 the number of employees in the West—a total of more than 1 million—decreased by 50,000 to 60,000. This year a similarly large decline is anticipated. In the East, just one out of two employees in the industry kept his job.

The head of the Association of German Machine-Building Enterprises (VDMA), Dr. Hans-Juergen Zechlin, looks at this calmly: "The companies are facing up to the altered conditions. They rationalize, adjust the management organization, look for new forms of cooperation and develop new products. They have rolled up their sleeves and should emerge stronger from the present crisis."

Diplomat engineer Guenter G. Seip, chairman of the board of the Electrical Installations and Systems trade association of ZVEI [Central Association of the Electrical Engineering Industry], can only look enviously toward the Far East: The Southeast Asian electrical market is growing at 10 percent annually—also at the expense of the European manufacturers. Now the electrical trade of the European domestic market wants to hit back: Seventy leading manufacturers have joined together in the European Installations Bus Association (EIBA) in order to recapture market shares with standardized, forward-pointing technology.

Meaning more money for applied and industrial research, which is important for market-capable innovations, at the expense of basic research? Prof. Joachim Treusch, chairman of the board of the Juelich Research Center, warns: "We must not gamble away our next century in order to see us through the last decade of this century with somewhat more savings." Japan, for example, is strengthening its basic research.

In that respect the German research landscape is well established—even in international comparisons. More than 20,000 industrial enterprises, 102 industrial research associations, over 300 advanced and professional educational institutions, 16 major research installations, 66 Max-Planck institutes and research groups, as well as 47 Fraunhofer establishments, are toiling hard.

But the research infrastructure is creaking. The advanced educational institutions have for years been complaining of increasing overloading; their research activities are suffering more and more from it. The funding possibilities of the German Research Association (DFG) are not keeping even approximate pace with the growing need. Basic government funding for Fraunhofer and major research facilities has been cut back for a long time to come.

And the research landscape in the new laender has been shrunk to a mini-format: Out of the formerly 74,000 R&D employees in the GDR, at the end of this year there will only be 12,000 left. The result: The increase in patent applications forecast by the president of the German Patent Office, Prof. Erich Haeusser, for the expanded FRG after unification will not take place.

In addition to political reasons there are also financial ones. State allocations to the research infrastructure in the old laender have been declining for years, and the struggle for money is getting increasingly more fierce.

As is the criticism. "The BMFT's [Federal Ministry for Research and Development] share of the entire federal budget today is clearly below the level of the 1970s and 1980s. In real terms, the federal government's R&D spending has decreased in the last few years," complains the Federal Association of German Industry (BDI).

On the other hand, BDI chief Tyll Necker praises the German industrial enterprises. Approximately 64 percent of the entire German research budget is financed by business and industry, and 72 percent of all R&D activities are undertaken there. Not quite 90 percent of the R&D projects implemented in industry are financed by business and industry themselves—a very high rate in international comparison.

But "the framework conditions for research, development and innovation activities by the enterprise sector have deteriorated," Necker complains. After abolishing the R&D investment bonus and the special R&D depreciations, Germany is practically the only major industrial nation without tax incentives for research, development and innovation. And an "oversized regulatory level" narrows the margin of action for R&D.

An example of this is the genetic engineering law in effect since June 1990. "When the rigorous genetic engineering

law with its implementation decrees took effect here, other countries such as the United States, Japan and Great Britain were already further reducing the barriers for their already practicable guidelines," fumes Prof. Gerhard Quinkert of Johann Wolfgang Goethe University in Frankfurt/Main.

The result: All major companies in the chemical industry prefer to conduct genetic research and production at locations outside Germany, primarily in the United States and Japan. In the United States there are now more than 1,000 places where genetic engineering takes place—and in the FRG only four. The boom in genetic engineering—the market is estimated to be $100 billion in the year 2000—threatens to pass the Germans by.

In order to stimulate growth, the state should deregulate the rules, demands management consultant Roland Berger of Munich. Furthermore, he urgently calls for higher education reform and shorter education times. And, lastly, Berger recommends to Bonn that it should finally make up its mind regarding an active technology policy.

This could be contained within an overall concept for the BDI. It should:

- include all levels of the innovation process from basic research to the early stages of marketing,
- establish clear focal points which straddle key technologies,
- optimally combine direct, indirect and specific means of support,
- include companies of all sizes,
- interlink all government support activities.

But: The lamentation from industry is one-sided, objects Konrad Seitz, presently ambassador to Rome and an expert on R&D policy. "The only correct approach is to develop products that can support the high wages, the way Japan used to do in the past."

Dr. Peter Oertli-Cajacob, a consultant with the SCG St. Gallen Consulting Group, sees the matter in a similar way. "There are standard excuses in Switzerland as well. If you look more closely, it involves 95 percent management errors and only 5 percent locational disadvantages. The wages in Japan are now higher than in Switzerland!"

Management errors were also reported by the McKinsey management consultant firm: Two-thirds of the cost disadvantages for German versus Japanese companies result not from higher wage and material costs but from insufficiently production-oriented design, shortcomings in the labor organization and a non-optimized vertical range of manufacture.

If the change does not succeed, mass unemployment threatens to become a long-term social explosive over the next few years. The layoffs, touted as being for the purpose of becoming "lean," by industry in the old production areas, can only be compensated for by new jobs in the high technology sector. Unfortunately, this process of realization is very slow to get going, complains Tom Sommerlatte, head of the Arthur D. Little management consultants. "We are in the middle of transition to a new technological age. Our present economic strength is not automatically passed on to the next generation."

Research Minister on Problems

93WS0434B Berlin ING DIGEST in German Apr 93 pp 17-18

[Unattributed interview with the head of BMFT Matthias Wissmann: "Japan Has Advantages"]

[Text]

[ING DIGEST] Mr. Wissmann, the German economy is threatened by recession. Do you consider one of the reasons for that to be a weakening of the innovative power of industry?

[Wissmann] The danger of a recession affects the entire world economy. The reasons for the weak economy should therefore not be sought just within the Federal Republic of Germany, where we still had a gross domestic product of 1.5 percent in 1992. Also, one should not hold research and development responsible for it, since many other factors influence the economic situation to a major extent. But I do, in fact, think it is of concern that industry's funding of research and development amounting to more than 62 percent in 1989 has dropped to 58 percent last year.

[ING DIGEST] What is your ministry doing to prevent the lag behind Japan in R&D-intensive products from getting even greater?

[Wissmann] The BMFT cannot, and I do not want to, pursue an interventionist policy. Furthermore, I am convinced that businessmen and engineers have more flair for future markets than do politicians and officials. My primary goal is therefore to act as a moderator in order to achieve better cooperation between science and business and industry. In this field the Japanese have major advantages. The closer interrelations between research and production are also important in our country, in order to continue to keep Germany strong as an industrial location.

[ING DIGEST] Where do you see fields in which the Germans can protect their technological lead in the future as well?

[Wissmann] One particularly important area for me is environmental research. Here we are already very good, but in the future innovative ideas will be in even greater demand, which must be converted into marketable production faster than before. The same applies to basic research, for which we spent about 3.5 billion German marks [DM] in 1992 alone. But we will also more strongly support application-oriented research.

[ING DIGEST] What contribution can the eastern German research establishments make to assure Germany as a business location?

[Wissmann] Many new research places work in the fields of modern advanced and top technologies: Environmental technology, new materials, biotechnology, information technology, optical and microelectronics.

In individual cases new technology-oriented enterprises have already been created from the incentives of these research facilities. In other cases research establishments in the new laender—for example, in communications technology or in the field of biosensors—have already acted as initiators and clients of research establishments and enterprises in the old laender. We must intensify these beginnings. This is primarily a demand for industry.

[ING DIGEST] Precisely industrial research and the research corporations are complaining about the lack of contracts and survival problems. How do you intend to support research in the East?

[Wissmann] This year we are spending nearly DM1.75 billion for the development of the research landscape in the new laender. Just in the last few weeks we succeeded in making approximately DM200 million available to eastern German industrial research. We thus support the establishment of Fraunhofer institutes in the new laender, because this is where cooperation between research and industry is particularly successful. My motto is help for self-help: I will make efforts to maintain research-intensive capacities in the new laender until they are able to survive on their own.

More German Patents, Fewer From Eastern Germany

93WS0435A Duesseldorf HANDELSBLATT in German 20 Apr 93 p 6

[Article by "OSL" under the rubric "Economy and Politics": "Patent Office: Markedly More Patent Rights in 1992. Information Was Lacking in the New Lands. Patent Applications Lacking in the Key Branches"; first paragraph is an introduction]

[Text] Munich, Monday, 19 Apr 93 (HANDELSBLATT, OSL)—The head of the German Patent Office, Professor Erich Hausser, characterized his office's trend as quite satisfactory. Patent applications increased again in 1992 and are growing further after two years of a shortage. But fewer applications came from the new federal lands—for Hausser a consequence of the economic situation and lacking information concerning patent rights.

This year, too, the German Patent Office is again submitting its annual report on schedule for the Hannover Fair. According to the report, more patent rights were applied for in 1992: 44,752 patents (42,718 the previous year), 17,004 utility-model patents (15,553 the previous year), 34,411 trademarks (33,791 the previous year), 55,899 design patents (53,953 the previous year) and 129 topographies (80 the previous year) like three-dimensional chips. Applications declined, from 59 to 51, only in the specialty field of typeface design.

Disappointingly Few Applications From the East

Hausser sees in the increase the return to the good old habit of innovations and patents running anticyclically. "In the big economic crisis the year 1930 brought a lone record with 80,000 patent applications. Companies stepped up innovations in order to be prepared for the later recovery," Hausser believes, and he supposes a similar motivation at present.

However, applications from the new federal lands were disappointingly few in number. "Though as before we figure that Eastern Germany can develop and apply for approximately 8,000 patents and 4,000 utility-model patents per year, however the economic situation has to improve first so that there can be investment in research and development. Also, knowledge is still lacking concerning the use of patent rights that have superseded the East Bloc's old certificates of authorship and economic patents, and experience with license rights is lacking. Patent agents for consultation and assistance are lacking."

However, the German economy's "lifeless dynamics" in key technologies disturbs Hausser still more. From experience, it takes four to six years until a product arises from a patent. Patents are thus early indicators: "What is being applied for today decides our technical and economic standing tomorrow." But a survey by the German Patent Office shows that German inventors are losing ground to Japan and the U.S. precisely in promising fields. For instance, patents in microelectronics dwindled from 359 to 224 in Germany in the last six years (1987 to 1992), while the Japanese increased their applications from 17,408 to 23,032.

"Even if one equates three to five Japanese patents with one German patent, because German patents are generally more comprehensive, the disparity and above all the dynamics are alarming, and this has been the case for years now," Hausser says. The U.S., too, with a doubling of 878 to 1,671 applications, is in a markedly better position than the federal republic here.

The Germans are behind similarly in mainframe computers, entertainment electronics, office technology and laser technology. It looks somewhat better in motor vehicles and also in aerospace technology. For years most patents have been applied for in Germany for "measuring and testing," where "we are undisputed world champions."

Much Too "Lifeless Dynamics" of German Key Technology

Hausser views the hole in his balance sheet more as a blemish: The gap between gross income and expenses (950,000 German marks [DM] in 1991) grew in 1992 to DM5.7 million with gross income of DM250.7 million and expenses of DM256.4 million, but "according to government accounting practice we have to post in yearly slices as expenses our investment for reconstruction of the office (DM129 million in 10 years) and for

our PATIS information system." Hausser wants fee increases only cautiously, and not at all in eastern Germany in the next five years, for that would "act as a brake on innovation." The office has regularly delivered surpluses in the last 10 years, which could also stand it in good stead one of these days now.

Germany: Database to Avoid Duplication of Research

93WS0435B Duesseldorf HANDELSBLATT in German 21 Apr 93 p 8

[Article by "UHL" under the rubric "Economy and Politics": "Databases: Interim Stock-Taking of a Model Experiment. Research Costs Too High"]

[Text] Bonn, Tuesday, 20 Apr 93 (HANDELSBLATT, UHL)—German companies spend more than 20 billion German marks [DM] a year for duplicate work in the area of research and development because available information is not included in decision making, they say.

Thomas Einsporn of the Institute of the German Economy (IW) made this statement on the occasion of an interim stock-taking of his institute's model experiment, subsidized by the Federal Research Ministry, for supporting the acquisition of information from databases (MIKUM). The deplorable state of affairs concerning information is becoming especially pronounced in the case of patent applications, he says. Approximately 30 percent of these applications are rejected by the German Patent Office because similar patents already exist. "Companies would have saved development costs and examination fees if they had taken into consideration in good time the patent information available on electronic media," Einsporn said. Every company that wants to exist in the market and strengthen its position will in the future have to pursue "strategic information management."

Almost 1,200 small and medium-sized companies have participated in MIKUM now after it has been running for two years. About 80 percent of them are companies with up to 200 employees. "Research and Development" as well as "Engineering" accounted for 50 percent of database searches. "Marketing" followed with about 35 percent and "Purchasing" with 9 percent.

Participation in MIKUM, which provides access to information from the approximately 6000 databases around the world, brings about substantial cost reduction for companies above all by saving time in acquiring information, through lower travel expenses, and through the smaller danger of expensive bad decisions.

Germany: Daimler-Benz Official on Research Policy, Organization, Evaluation

93WS0435C Duesseldorf HANDELSBLATT in German 21 Apr 93 p 26

[Article by "BEU" under the rubric "Companies and Markets. The Hannover Fair": "Daimler-Benz AG: Research Results Have to Be Assimilated More Quickly. Research Head: We Need the Creativity of Young Staff Members"]

[Text] Hannover, Tuesday, 20 Apr 93 (HANDELSBLATT, BEU)—German research results are being converted into commercializable products and processes much too perfectly and therefore also much too slowly. Dr. Volker Lehmann, research director of Daimler-Benz AG [German Stock Corporation] in Stuttgart, with this declaration stated at the Hannover Fair, the reasons for the failing competitiveness of many branches of German industry. Nevertheless, Lehmann was convinced that the present decline in economic activity can be turned into greater competitive strength.

Daimler-Benz spends from its research and development budget of around 9.3 billion German marks [DM] around DM600 million a year on pure research, Lehmann emphasized. This is 8 to 10 percent of the internally financed development outlays of the four company divisions. About 1,700 researchers are working at the Stuttgart, Ulm, Frankfurt, Munich, Berlin and Friedrichshafen locations. To the extent that the group is operating internationally, it will have to think about research abroad also in the future. While there have been no specific decisions about this yet, however, the group is working on contacts with key foreign universities in order to increase the percentage of foreign researchers from the present just three percent.

Daimler-Benz has developed "integrated research and development management" in the last two years in order to be able to make decisions more quickly, make research more in tune with the market and facilitate the transfer of know-how in the group. A coordinated parallel approach has come instead of the former usual step-by-step development of new products. Research goals will be coordinated each year between the group's research and company divisions.

No Researchers in an Ivory Tower

The group, Lehmann says, needs the "business-oriented researcher," who also asks the question whether the aimed-for conversion of research results into marketable products is being achieved, the expense/benefit ratio is in accord with the work and the quality of the results meets the products' specifications.

The group has brought into being an exchange group as an additional tool for improving the transfer of knowledge: In this case junior trainees, i.e., young college graduates, will first take part in various projects for one or two years before they obtain their aimed-at "target position" in research. Lehmann: "We need the creative input that young staff members above all bring." Therefore the group is aiming for a personnel structure of 35- to 40-year-olds in research. The bulk of staff members are to work for five to eight years in research before they change to company divisions or other facilities.

Listening Post for New Technologies

Daimler has established branch offices in Boston, Tokyo and Moscow as an early warning system for newly maturing technologies. An additional location on the U.S.'s west coast is to come soon. Technological trends will be analyzed there, that are forming and are still a long way from product ideas but that have an inherent marketing potential.

Daimler-Benz research is also taking new approaches in evaluating its own work. An audit has been introduced in addition to the usual controlling. What this means, according to Lehmann, is that inside and outside experts discuss with the individual research groups to what extent their work meets the criteria they themselves have set.

In order to safeguard Germany over the long term as a research base, and accordingly an industrial base, Lehmann is pleading for a "consensus-based" working together of politics, society and business. The body's politic job is to provide an innovation-friendly climate and an efficient infrastructure. It should promote new technologies, by allocating funds for projects, for example, by promoting the establishment of industrial standards and norms, or by the Europe-wide standardization of rules and regulations.

Germany's Wissmann Gives Research Policy Speech

93WS0436A Bonn BULLETIN in German 18 Mar 93 pp 195-197

["Text" of speech by Minister for Research and Technology Mattias Wissmann, delivered at the plenary session of the chamber of Industry and Commerce held in Stuttgart on 16 March 1993: "Innovation Strategies To Safeguard Germany's Position in Field of Technology"]

[Text]

I'm very happy to be able to speak to you today here in Stuttgart. In the now barely eight weeks of my activities as minister for research and technology I've taken detailed stock of the German research policy. Together with creative and knowledgeable professionals from the scientific and economic sectors, I have now worked out my basic positions—today, I am in a position to be able to present them to you.

That this has taken two months is due, on the one hand, to an extremely complex subject matter and, on the other, to the fact that I did not want to make a mistake for which people reproach politics—now and then rightly so too—shooting from the hip.

The point of departure for my views is the competitiveness of Germany's position—today, and above all, in the years to come. German industry's success during the past 10 years has been based on first of all technologically high-quality products:

In 1991, Germany was the second-largest exporter in the world, barely behind the United States and clearly ahead of Japan. The trade balance surplus totaled almost DM23 billion. Exports exceeded imports in trade involving technology-intensive products by an incredible DM87 billion.

Without this success, the trade balance would have been negative. Technology-intensive products were also the vehicles of German success with exports in past years.

Secondly, we must again and again make people aware of the fact that about two-thirds of the enormous increase in business activities in western German industry between 1984 and 1991 took place in technology-intensive industries.

Therefore, research and technology have accounted for a disproportionate share of the increase in business activities in Germany since the mid-1980s. Thus, the viewpoint expressed in our research policy goes far beyind questions involving Germany's economic position [in the world]. Science and technology are characteristic of our society as a whole.

In view of this background, I feel that it is extremely alarming that the money the economic sector spends on research and development has for several years now been increasing at an clearly lower rate than the gross domestic product. While the latter increased by over 25 percent from 1989 to 1991 in the old and the new federal states combined, expenditures by the economic sector for research and technology during the same period increased by only a good 8 percent. The economic sector's contribution to the financing of the German research budget has also decreased. From over 62 percent in 1989 to just a good 58 percent in 1992.

In Japan, the development of this area has been exactly the opposite. In the difficult economic situation and in the face of increasing international competition, Japanese companies are betting on new ideas and new products. The Japanese economic sector increased its contribution to the financing of the research budget from 69 percent in 1987 to 73 percent in 1990—and this is a continuous trend.

We here in Germany, too, need a change of trend since the economic lifeblood of Germany's position in the world is the close link between extreme industrialization and intensive foreign trade. This is precisely why Germany must not exhibit any weaknesses in technology-intensive fields.

The Ministry for Research's response to these challenges is innovation strategies for the future. In the process, I, as minister of research, am not prepared to assume the role of "night watchman" of our research and technology policy. On the contrary, I will actively assume my responsibility. The creation of the optimal conditions for research and innovation is the chief responsibility of our national research policy.

Precisely in times of scarce budgetary funds and a difficult economic situation, the blood supply to the brains of the industrial nation of Germany must not be cut off.

But, on the other hand, I would like to make it clear that the Ministry for Research will not succumb to the temptation to prescribe the course and direction of a necessary structural adaptation with interventionist strategies or directly intervene in investment and innovation processes with subsidies and protective measures. I'm sure that engineers and industrialists always have the best nose for new ideas and marketable products. A market economy is not an economy of bureaucrats.

I see the minister of research's chief responsibility as being the strengthening of Germany's competitiveness in the field of technology.

This means creating the necessary general conditions for once again stimulating the dynamics of the development of new and marketable high-tech products, a process that characterized the growth of the 1980s. It is of great importance to me for us to reduce the number of obstacles to innovation in, for example, the form of statutory regulations and bureaucratic procedures. An improvement in precisely these general conditions is often more effective than the investment of public funds.

A negative example from the very recent past is the law governing biotechnology. There is no need to wonder why we are lagging behind internationally in this field if we take the example of a community in Lower Saxony, where, because of a request to release transgenetic potatoes, about 3,000 written objections were submitted.

These are the consequences of exaggerated statutory regulations and overbureaucratization. As a result, there were only two releases of biotechnologically altered plants in Germany in 1992, as opposed to 858 in the OECD countries.

Naturally, there are moral limits to research and technology. I firmly believe that we must exercise the greatest care in adhering to them. But we must not suppress the freedom to engage in ethically justifiable research and technology.

I am also of the opinion that, as a uniquely important industrial nation, Germany cannot in the long run afford to do without tax support for research and development. This is why, within the framework of the future overall plan for industrial tax reform, we will consider what aid models might look like. We would have to ask ourselves whether, viewed in terms of the long run, we would not do better to provide aid for "brains" instead of "concrete" with tax write-offs.

I will set about strengthening the competitiveness of Germany's position in the following additional areas:

First, I will personally fight for an improvement of the status of the new federal states.

The new states are facing big challenges in their development of modern research and technology structures. The situation industrial research is in is especially critical. Only 2.5 percent of Germany's research-intensive exports come from the new federal states.

It is therefore especially gratifying to note that we succeeded, within the framework of the negotiations on the addendum to the 1993 budget, in creating the prerequisites for unfreezing DM200 million for industry-related research in the new federal states.

With its innovation strategies, the Ministry for Research and Technology will in future set in motion a bundle of measures for the additional strengthening of eastern German industrial research:

—The development of an infrastructure that promotes research and development;

—An increase in the competitiveness of the technology sector;

—The establishment of technology-related means of subsistence;

—Aid for medium-sized, innovative businesses.

It is now a matter of ensuring the continued existence of efficient research capabilities in the new federal states and of developing them further. The new federal states' chances of succeeding lie in support for and the development of products for the future. I will therefore consider whether and how the existing apparatus for promoting precisely these products for the future can be expanded.

I would furthermore like to take advantage of the opportunity to break up the archaic structures of the university sector in the new federal states. Therefore, I will launch an initiative to promote the introduction of "innovation colleagues" at the universities of the new federal states. The heart of this idea is to, in time, enable scientists from different disciplines to collaborate on interdisciplinary research projects.

First, I plan to carry out a few pilot projects in the new states. This is a chance to make use of the reconstruction of the university landscape. If we succeed in developing forms of interdisciplinary collaboration and successfully set them in motion, these models can later be introduced in the old federal states too.

Second, peak German achievements in basic research must lead to a technological lead faster than they have up to now, a lead which can then also be transformed into competitive advantages in markets.

The technologies of the 21st century will be especially characterized by the fact that they conserve resources and protect the environment. They will make it possible to solve problems without letting damage occur in other places.

This will involve projects in fields like the development of new materials, the production of technological management techniques of the future, or biological and genetic engineering methods and microsystem technology and microelectronic processes.

In these fields too, it is true that government aid can under no circumstances replace industry's own necessary efforts. But the Ministry for Research will support the economic sector in this endeavor to develop its own strengths.

I'm convinced that, with a clearcut division of roles between the government and the economic sector, the research policy can help to enormously speed up the transfer of technology and the rate of innovation and to improve German industry's chances in its markets.

Third, I will fight for more intensive aid for medium-sized businesses.

In view of the great importance of the medium-sized business economy for the competitiveness of the technology sector—about which I needn't tell you here in Baden-Wuerttemberg—the Ministry for Research will further increase aid for and restructure aid for small and medium-sized companies. With an aid sum of roughly DM600 million a year, the structuring of aid will be considerably simplified.

The measures which I'm aiming for will, in future, be supported by three pillars:

—Aid for small and medium-sized companies within the framework of specialist programs;

—Research and development loans for rapid innovations;

—A new measure to promote research collaboration.

High-quality collaboration on research and development projects would be promoted through this measure. The goal is to develop innovation strategies that offer a promising future for medium-sized companies. With them, priority would be accorded the acceleration of interindustry conversion of research projects into marketable products and cooperation between the economic and scientific sectors will be intensified.

Fourth, I would like to get the research policy involved in the federal government's overall conception of our policy toward Europe more comprehensively than it has been up to now.

The conception of our European policy held in the research and technology policy is a very comprehensive field. I would, therefore, only very briefly like to explain to you just a few of the main themes of my ideas on policy:

It will be a beginning toward enabling small and medium-sized companies to better gain access to EC aid funds. Their potential is at present only inadequately utilized in Brussels. Small and medium-sized companies currently receive only about 15 percent of EC aid funds for research and technology.

Furthermore, I'll work for a more open and efficient procedure for the EC Commission to decide on applications for aid funds. Only competent assessment of the scientific and technological quality of forward-looking projects must be the decisive factor in awarding aid funds for them.

Therefore, in choosing its evaluators, the EC Commisson should base itself more on recommendations from the scientific and economic sectors of each of the member states. Consequently, in order to clearly simplify the procedure for providing aid for companies, I will immediately enter into talks in Brussels tomorrow.

In future our research policy will only be able—not least of all in hard times in terms of budgetary policy—to finance necessary major projects transnationally. This is why I emphatically support more and better cooperation within the European framework to further develop the EC general program as well as to replace national efforts with this cooperation. We need more cooperation between research facilities in Europe.

In view of the enormous challenges we are facing in, for example, the environmental sector, in planning for a future that is oriented toward the public welfare, more importance must be assigned to the fields of ecological research and environmental technology, research on energy, research on health concerns, and research on traffic. As I see our research policy, the areas of environment, traffic, and health are among the most important challenges.

A field that has always been of the greatest importance to me is ecological research, environmental technology. Therefore, before the year is out, the minister for research and technology will present a conception of environmental research with a new agenda of the main points to be concentrated on. The research policy must make its contribution to a reconciliation of the environment with the economy. This is why this new orientation of aid will concentrate on technological advances that, through integrated solutions, do not, insofar as is possible, allow residual materials that are harmful to the environment to be produced at all.

It is anticipated that environmental technology will make crucial contributions to this. Medium-sized companies in particular will have a chance to participate in the future growth of this sector of the economy through intelligent integration of technological concepts and operational realization.

In the field of health research, as early as this spring we're going to set priorities for the future with the Health Research 2000 program. The main points to be concentrated on in it will be currently widespread diseases like cancer, AIDS, and other infectious diseases as well as heart diseases and circulatory disorders.

First, the Ministry for Research will provide funds for the establishment of model centers for interdisciplinary clinical research that are now under construction. These are expected to bring together in a new kind of organization collaboration on basic biomedical research and developments in practical medical diagnosis.

In the field of health research, with these we also intend to accelerate the pace at which development, research, and science arrive at practical application.

An ecologically harmless energy supply will also in future continue to be one of our vital problems. For this, innovation strategies are called for in two directions: These are energy-conserving management and the development of as many nonpolluting sources of energy as possible.

Furthermore, in the process we have to rely on conventional kinds of energy, but we must also set our course for improved energy supply prospects, greater safety in the utilization of nuclear energy, renewable sorces of energy, and switching to new possibilities for conserving energy.

To demonstrate the possibilities there are in the use of solar energy in combination with energy-conserving technologies, I'm going to launch the Solarthermy 2000 program in the new federal states. This involves the testing of integrated systems with the prospect of practically applying them as soon as possible as well in the extensive construction and modernization operations taking place in the new federal states.

An area that I'm particularly concerned about is traffic technology and research on traffic systems. We will only solve the ecological problems in this area if we convert the enormous technological advances that have been achieved into practical application in the years to come.

Traffic accounts for 20 percent of the CO_2 emissions in Germany. Since we are increasingly becoming a transit country between East and West, transit traffic will probably be sixfold by 2010. It is estimated that there will be a total increase of about 30 percent in passenger traffic and about 75 percent in freight. The central ideas for traffic research and technology are therefore the optimization of chains of traffic and ensuring mobility compatible with the environment.

For me, the key concept for the solution of these problems is "integrated traffic." We need more cooperation from the rail, road, and inland navigation traffic sectors with the goal of integrated chains of freight traffic. We need more information on freight standards and movements as well as an information technology that is custom-tailored to them and more "integrating management."

Traffic flow control is an extremely complex affair and simple solutions like the demand that we switch from cars to trains fall much too short of working if they are not supported by technological advances. Shifting just 1 percent of the volume of freight traffic on the highways to the railroads means an increase of 10 percent in rail traffic.

Ladies and gentlemen, we must realize that new focal points in our research and technology policy are only possible if we also establish "posteriorities." We will have to decide against some projects and, in other cases, we will have to speed up the decision-making processes.

I know that the innovation strategies that I have sketched here come at a time of strained budgets and great challenges for all of us. The reconstruction of the new federal states is also a top priority for the federal government and for me. This challenge is a task that calls for a tremendous effort on the part of Germany. The Ministry for Research will also make its contribution to this.

In its requests, the Ministry for Research draws the relevant consequences for the 1994 federal budget as regards mid-range planning of finances as well as plans for projects:

—No new major basic research projects;

—A ceiling on major research facilities;

—Restrictions on contributions to international aid;

—No new major national space projects;

—No fifth space program;

—Reduction of grants for research on fossil fuels. This applies to, for example, research on coal, power plant technology, or the planned MTT (multiphase transport) project, which we have to abandon.

—No aid for analog HDTV (high-density TV).

It is necessary to set posteriorities in order to be able to pave the way for innovations and release flexible funds for them. The Ministry for Research's future fields in research and technology sectors whose usefulness for the public welfare is clearly understandable and which today are already giving rise to really great expectations.

Germany: EC Research Policy To Aid Economic Recovery

MI1105141393 Bonn TECHNOLOGIE-NACHRICHTEN MANAGEMENT-INFORMATIONEN in German 30 Mar 93 p 14

[Text] In times of stagnation and unemployment, the economy can be boosted by financing major projects (e.g. railways, motorways, energy) and creating investment incentives for small and medium-sized enterprises. The EC had taken the first steps in this direction at the summit meeting in Edinburgh in December, 1992, but scientific and technological research can also make an important contribution at EC level. In Edinburgh, the Twelve had called on the Commission to draw up

proposals, and on 9 March the EC commissioner responsible for research, Antonio Ruberti, put forward new proposals that stem from three basic ideas:

—All research work in the EC should be treated as a whole;

—A strict selection procedure should be adopted;

—The gap between research and training should be narrowed.

These new proposals will complete the future outline research program, which includes all the research work from 1994 to 1998 supported out of the EC budget. When presenting its initial proposals for the outline program last September, the Commission had estimated the cost to the EC budget at ECU14.7 billion. The current program still amounts to several billion ECU, but corresponds to only 4 percent of all state research expenditure in the 12 EC countries. The Commission thinks, therefore, that the Twelve should coordinate their research schemes better with one another and with those of the Community and the various research bodies such as EUREKA [European Research Coordination Agency], CERN [European Nuclear Research Center], and ESA [European Space Agency].

In view of the limited funds, it proposes that the research projects be restricted to certain technologies capable of benefiting several sectors of industry. The new proposals also incorporate traffic and urban living.

According to the Commission, European research should also help to improve vocational training standards and increase the number of people skilled in the new technologies.

Germany: Research Ministry Approves New Fraunhofer Silicon Institute

MI1105141093 Bonn TECHNOLOGIE-NACHRICHTEN MANAGEMENT-INFORMATIONEN in German 30 Mar 93 p 6

[Text] In the light of a new coverage concept for the planned new Fraunhofer Institute of Silicon Technology (ISiT), the BMFT [Federal Ministry of Research and Technology] has now granted half of the construction costs of about 149 million German marks [DM]. The other half will be borne by the land of Schleswig-Holstein. The Fraunhofer Society will wind up the Institute of Microstructural Engineering in Berlin and relocate nearly all its staff and a large portion of its equipment to Itzehoe once the construction work is completed. The institute will focus mainly on microsystems engineering and application-specific integrated circuits (ASICs).

Federal Minister Wissmann said in Itzehoe that ISiT would play an important part in giving the user industry secure, early, and readily obtainable access to microelectronics. When planning the new concept for ISiT, the BMFT had, therefore, placed great emphasis on ensuring that the institute's program of work was coordinated nationally and at EC level with potential partners from industry and with the associations. This process of coordination had laid the basis for the new ISiT concept.

As ISiT develops further, close contact will be maintained with the institute's industrial partners. In times of economic difficulty, many companies tend to economize on research and development. This was a false economy with serious consequences, particularly in microelectronics. Nor, too, should the public sector restrict its research work. It should buck the trend and invest in brainpower and new ideas, particularly in difficult times.

A strong research capability alone was not, however, sufficient to ensure industrial competitiveness for the microelectronics industry. Wissmann warned that this was and remained up to the industry itself, which must take responsibility for its own position in this key technology.

ISiT is intended to help link the research done in state-run institutes with industrial research and development, and to support innovative processes among companies that do not have their own facilities for long-term basic research. This applies in particular to small and medium-sized enterprises.

Italy: Biotechnology Science Park Inaugurated

MI1105143093 Brescia BIOTEC in Italian Mar-Apr 93 pp 61-62

[Text] On 5 March 1993, a seminar was held in Piacenza (Italy), to inaugurate the "Milan Biopole, A Science Park for Biotechnology and for the Bioindustry." This project is backed by the Association for Metropolitan Affairs and grew out of a decision, which was practically obligatory, to invest in new technologies with a view to making Italian industry more competitive on the international market. Biotechnology is, in fact, a particularly promising field in terms of its potential scientific, industrial, and occupational impact. It was for these reasons that it was deemed necessary to create a structure for research, training, and technological innovation that would allow the results of research to be effectively transformed into manufacturing activities.

The biotechnology science park consists of:

—The MIB [Milan Institute of Biotechnology], an institute for applied research, development, and transfer that will work in collaboration with the universities on multidisciplinary research in the strategic sectors of biotechnology. The MIB will be equipped with a Technicum, able to house scale models of equipment under GMP conditions.

—The CIB [Center for Bioindustrial Innovation], an industrialization support structure that will provide technology transfer services and an economic-managerial and legal consultancy service in relation to

marketing, patents, trademarks, and related regulations, for example, as well as providing fully-equipped working space (incubators). In collaboration with Technicum, it will supply various services to companies (fermentation, chemical analyses, and certification and validation of biotechnology products).

—Biotecnorama, a communications structure that will organize activities in collaboration with institutes and bodies in the specialized professional training sector, as well as providing an information service to distribute scientific information through the press, or through multimedia communications systems.

The Milan Biopole will have its headquarters in a 10,000-15,000 square meter building situated in the Milan Bicocca science park, where Milan State University departments whose disciplines are closely connected to the Biopole, will also be situated. The Biopole will work in collaboration with all the main research structures, such as those at Brescia, Pavia, and Piacenza.

The Biopole will be supported by a public interest foundation, (in which local bodies, banks, and other interested parties will participate) which will set up a private management company. The main task of the Milan Biopole Foundation will be to solicit EC, national, and regional funding for building construction and for scientific equipment.

The Milan Biopole is designed to act as an interface between academic and industrial research in strategic sectors of industrial and environmental biotechnology. It will develop multidisciplinary know-how at international level in key sectors such as structural biology, protein engineering, bioconversion, biotransformation, cellular systems for samples, downstream processing, and bioseparation, etc.

Collaboration with companies will take place at various levels:

a. Joint research projects carried out at the MIB;

b. Technology transfer activities carried out by the CIB;

c. The housing of industrial enterprises in the CIB incubators, and the placing at their disposal of the MIB equipment and know-how;

d. The supply of technological and economic-managerial services.

For large-scale industries, the possibility of utilizing the external R&D facilities available at the MIB will mean being able to delegate specialized areas of research, set long-term research objectives, accelerate the realization of projects, divide the cost of expensive projects, gain access to new areas (technological windows), and take advantage of new opportunities in relation to product portfolios.

Innovative small and medium-sized industries will be able to use the Biopole's resources to develop new activities by taking advantage of the technology transfer services and by having access to collaboration with research institutes, and to various consultancy services. Small and medium-sized industries will also be able to diversify their activities by using the incubator structures, without having to invest in new structures.

The following were present at the seminar:

—Prof. Lilia Alberghina, president of the Milan State University School for Specialization in Biotechnological Applications, who described the scope of the project in a paper entitled "The Milan Biopole: A Network System in the Po Valley."

—Pier-Giuseppe Torrani, a lawyer, and vice-president of the Metropolitan Affairs Association of Milan, who, with his paper "Milan Biopole: Technology Transfer to Industries," underlined the importance of the relationship between the MIB and industry and highlighted future possible collaboration with the universities.

—Prof. Vittorio Bottazzi, director of the Institute of Microbiology and the Biotechnological Research Center of the Faculty of Agriculture at Piacenza-Cremona. In his paper "Biotechnological Innovations From the university Departments at Piacenza and Cremona," he emphasized the importance of the Piacenza-Cremona scientific axis, which is characterized by a good general organization, by the complex variety of its know-how, and by its accumulation of experience and efficient scientific equipment.

University and Scientific and Technological Research Minister, Prof. Sandro Fontana was also present at the seminar.

Netherlands: Government's 1993 Biotechnology Subsidies Noted

BR0505084493 Rijswijk BIONIEUWS in Dutch 10 Apr 93 p 3

[Unattributed article: "Economic Affairs Earmarks 27 Million Guilders for Biotechnology"]

[Text] The Ministry of Economic Affairs is providing 18 million Dutch guilders to companies which want to carry out a project in the field of biotechnology, while an additional 9 million guilders will be allocated to activities such as knowledge transfer, improving the research infrastructure, and better coordination between national and EC biotechnology programs.

The ministry will allocate the money through the biotechnology segment of the Program for Industrial Technology Promotion (PBTS Biotechnology). A total of 1 million guilders will be allocated to feasibility studies, while 17 million guilders will go to research projects.

PBTS Biotechnology provides support to innovative biotechnological research projects aimed at the development of new products, processes, and services conducted

by companies. In the pharmaceutical and plant improvement industries in particular, much use is already made of biotechnology, but this is not yet the case in other sectors.

Just as last year, special attention is being given to companies and sectors which have no, or very little, innovative biotechnology applications. A new aspect is the extra attention being paid to cooperation between companies, with emphasis on vertical collaboration among companies developing the same product.

Germany: Research Minister Plans Cuts in Space Program

AU1404112293 Hamburg BILD AM SONNTAG in German 11 Apr 93 pp 2-3

[Interview with Research Minister Matthias Wissmann by Barbara Schmid; date and place not given: "Those Who Do Not Complete Their University Education Within Reasonable Time Should Pay"]

[Excerpt]

[Schmid] The D2 mission is to start on 24 April. Will this be the last manned space mission of the Germans?

[Wissmann] We can no longer afford a project involving 900 million German marks [DM] on our own. The competition between the systems is over after the end of the cold war—and thus also the time of national prestige projects in the East and the West.

[Schmid] Can you elaborate on the future German space program?

[Wissmann] Manned flights will only be carried out if required. Robots are much cheaper—also because of the lower security requirements. A total of 19 percent of the research budget (DM9.4 billion) are spent on space travel. I want to reduce this percentage. Thus, we are currently examining all existing contracts. The United States, too, wants to spend less. My goal is international space research with joint projects involving the United States, Russia, Japan, and European countries. Those who spend tax money must be prepared to answer questions concerning the usefulness. In the future we will invest less on research into weightlessness but more on environmental and climatic research and the observation of the earth.

[Schmid] Japanese enterprises push German companies out of the market for micro and entertainment electronics. What can you do about that?

[Wissmann] For CD players and color television sets most patents came from Germany, but the Japanese offered marketable products more quickly. I want to change that through better cooperation between research institutions and enterprises. Small and medium-sized enterprises will receive research funds in the form of subsidies and low-interest loans so that they can market their newly developed products as quickly as possible. I have also established a strategy circle consisting of scientists, entrepreneurs, and trade union officials, which is designed to improve cooperation between researchers and practicians. [passage omitted]

JESSI Automated Wafer Production Project Reaches Test Stage

BR1005150393 Rijswijk POLYTECHNISCH WEEKBLAD in Dutch 16 Apr 93 p 5

[Article by Rene Raaijmakers: "New Factory Supplies Made-To- Measure Chips; Flexible Automated Wafer Production in Heilbronn Consolidates European Strength in Systems Sector"]

[Text] Heilbronn—This summer, the Daimler-Benz subsidiary Telefunken Microelectronics (Temic) will begin flexible automated wafer production within the scope of a JESSI [Joint European Submicron Silicon Initiative] project into the extensive automation of integrated circuit [IC] production, in which various European microchip manufacturers are cooperating.

Workers in dust-proof "bunny suits" are currently putting the finishing touches to a new chip production line at Temic. Within this line, silicon wafers the size of saucers will move between machines entirely automatically. Production equipment will be activated on demand or will provide passive supervision as the wafers pass by. Thanks to computer-integrated manufacturing techniques, the worst atmospheric polluter—human beings—will almost entirely be excluded from the clean rooms.

The Daimler-Benz subsidiary's site in Heilbronn has been selected as test site for a new chip manufacturing process. Temic, a company in which Daimler-Benz subsidiaries AEG [General Electric Company] and DASA [German Aerospace] have merged their microelectronics activities, also provides chips to its sister company Mercedes.

Envy

Flexible Automated Wafer Production (FAW) is a JESSI project in which at least 30 British, German, and French companies are collaborating as a consortium. The aim is not to build a large-scale chip factory, like those where DRAM [dynamic random-access memory] chips are made (with which Japan took the world by storm in the 1980s), or an American-style microprocessor plant, which is now the envy of the Asians. The chip factory in Heilbronn will not churn out millions of identical pieces of silicon for months at a time. The FAW line will instead be a kind of luxury "bakery," where the IC equivalents of croissants, muffins, bread rolls, bloomers, and poppy-seed loaves can be baked in any shape or quantity and at any time. The factory will manufacture ASICs (application specific integrated circuits), for which demand is steadily increasing, according to the participants in the project.

The German Ministry of Research and Technology (BMFT), too, expects the use of ASICs to soar over the coming decade in major industrial sectors such as telecommunications, computing, industrial and consumer electronics, and the automotive industry. By contrast, the BMFT estimates that the number of standard ICs will hardly rise at all and may even fall in all the above sectors, except telecommunications. Chips will increasingly be "made to measure." The need for flexible automated chip factories, which can quickly switch to other processes, will continue to rise because some small production runs require only a few thousand or even a few hundred integrated circuits.

"Flexible automated wafer production will enable us to make a profit even on small-batch production," says Professor Engineer Hartmut Weule, a board member of Daimler-Benz.

Forefront

The FAW production line at Temic in Heilbronn will be a forerunner to the follow-up projects which are yet to be developed in France and Great Britain. The production line in Germany will be equipped for 0.5-micron technology on 150-mm wide silicon wafers. Later on, France will aim at 0.5- to 0.35-micron structures on 200-mm wafers. Toward the end of the century, the British factory will produce 0.35- to 0.25-micron line widths, for which memory chip manufacturers are currently conducting the relevant development work.

Netherlands: RACE Broadband Interface Project in Test Stage

BR1005150093 Amsterdam COMPUTABLE in Dutch 16 Apr 93 p 2

[Article signed MP: "PTT Research Demonstrates Broadband Technology"]

[Text] Leidschendam—PTT [Netherlands Telecommunications Authority] Research has commissioned a pilot installation for broadband transmission techniques. The research results from various European laboratories and research institutes are combined into one system, known as Broadband User Network Interface (BUNI).

The BUNI project is part of RACE [Research and Development for Advanced Communications Technologies in Europe], a European Commission research program to develop new standards for broadband network/user interfaces. The pilot installation has a dual purpose. First, it will determine whether the BUNI standard works. Second, it offers a way of demonstrating the results of various RACE projects in the field of broadband technology. The equipment is also used to look into new services.

BUNI is based on ATM (asynchronous transfer mode) technology and can be connected to SDH (synchronous digital hierarchy) networks. The PTT laboratory simulates several work areas. In view of the possibilities offered by broadband ISDN [integrated services digital network] for television signal, videophone, and HDTV [high-definition television] transmission; studio, home, and office situations are being simulated.

PTT Research believes that the BUNI demonstration is an important project. "It shows how the analog telephone network can be developed, via ISDN, into a broadband network of the future."

The research results achieved so far will be incorporated into the TRIBUNE follow-up project; TRIBUNE stands for Testing, Ratification, and Interoperability of User Network Interfaces. This research should produce an ATM network which will be used by other researchers to test broadband applications. This project will be conducted by PTT Research.

France: New Research Minister Outlines Goals

BR1905101893 Paris RECHERCHE TECHNOLOGIE in French Apr 93 pp 5-6

["Extracts" of speech by Minister for Higher Education and Research Francois Fillon to university presidents on 15 April; place not given: "Francois Fillon Delivers Speech To Conference of University Presidents"; first two paragraphs are RECHERCHE TECHNOLOGIE introduction]

[Text] Francois Fillon, the new minister for higher education and research, told university presidents—in his first speech to them given on 15 April—that fighting university failure, ensuring independent modernization, and developing partnerships are the three main lines of action that he wishes to pursue.

Fillon said that at that moment it would be premature to define the government's policies for the coming months, but nevertheless outlined to the university presidents some of his views on higher education and research. Below are some extracts from his speech.

Method

"Over the coming weeks, I will meet with the various representative organizations which are active in our higher education system. I will consult individuals, both from the university community and the rest of society, and analyze the various arguments and proposals. Then the time for action will come, and I would like to meet you again at your June conference, where I will present to you my future objectives and policies."

Commitment

"I do not wish to promise in words alone and do not believe in incantations. I want you to know that I will do what I say. I will not commit myself if I cannot follow up my intentions and I will only say what I can do. Once the framework for my policies has been defined, I will select priorities and provide the means for their implementation."

'University 2000'

"'University 2000' is the fruit of ambitious policies, but I have to emphasize that the initial results have been delayed and that we have lost a lot of time. When sites are started, they are often the result of initiatives by local organizations while the national government has not been able to meet its commitments."

Educational Reform of First and Second University Cycles

"The definitive version of the reform has taken greater account of the diversity of disciplines and is less rigid than the first version. The cost of this reform has never been properly calculated. I am asking the General Inspectorate of the National Education Administration to draw up a report on this subject. I must urge you to show the greatest prudence when implementing this reform if you are not sure of being able to finance your actions. I would ask you to suggest various adaptations, provided, of course, that they do not endanger the national aspect of diplomas."

Social Scheme for Students

"We must pay special attention to the living standards of our students, who are the very reason for the existence of your universities. I believe that there has been a tendency to discuss rather than actually produce a "student social scheme." I have asked Albert Prevos, the director of CNOUS [National Center for University and Academic Works] to organize a report on the subject, while holding the widest possible discussions with student organizations."

IUFMs

"It has not been possible to find the consensus and solid foundations necessary for teacher training. This has been amply proved by the debate about the IUFMs, whose hurried and widespread implementation was based more on ideological considerations than efficiency. Experimenting and not waiting for an assessment of the first three IUFMs was a serious mistake. I have decided to organize a rapid and detailed assessment of the IUFMs, together with Francois Bayrou. The university status of these institutes must be enhanced, yet they must not become competitors to your universities. Real improvements must be quickly suggested before asking ourselves about changing the institution itself."

Staff

"High-quality education and research is the goal." With regard to IATOS staff, he said: "I give your conference the task of continuing in this direction (a white paper) and sending me your proposals after a broad consultation process, in particular with the representative organizations of the staff concerned."

International Contacts

"Here, I would strongly urge opening up our higher education system internationally, especially in Europe—and this means not only the European Community, but also Eastern Europe. Also, the French-speaking world must not be forgotten. I would like to emphasize how much this international approach is linked to the further development of language training in your universities, which in no way will undermine the defense of the French language. I wish to take initiatives in this respect."

Research

"I am considering developing synergies between the domains of higher education and research. The fact that both are covered by one ministry must not be a mere formality. My aim is not to manage two separate sectors in parallel, but to follow one set of policies. I know how important it is that your universities have associated teams or mixed laboratories with the CNRS [(French) National Center for Scientific Research] (in this respect I am very pleased about the agreement that you signed recently with the CNRS). Also, why should we not envisage similar cooperative links with all the major research bodies, not just the CNRS, INSERM [National Institute for Health and Medical Research], or INRA [National Institute for Agronomic Research], but also the CEA [Atomic Energy Commission], CNES [Center for Space Research], ORSTOM [Office for Overseas Scientific and Technical Research], or others."

France: New Research Minister on EC Science Policy

BR1905145593 Paris RECHERCHE TECHNOLOGIE in French Apr 93 p 16

["Extracts" of speech by Minister for Higher Education and Research Francois Fillon to the National Scientific Research Committee on 22 April in Strasbourg: "Francois Fillon Addresses National Scientific Research Committee"; first paragraph is RECHERCHE TECHNOLOGIE introduction]

[Text] On 22 April, Francois Fillon opened the second plenary session of the National Scientific Research Committee in Strasbourg. The session dealt with the prospects for EC science policies. Below are extracts from his speech.

"You can rest assured that in me you will find an untiring defender of the national research effort. It must remain one of the government's top priorities."

European Science

"European science is now a reality. I am delighted that such a high scientific authority has decided to devote its second plenary session to the prospects for EC science policies. By doing so, your National Committee has confirmed its alertness to a topic of decisive importance

for the future. By carefully considering this topic, European science policies can be given a new lease on life."

"I am convinced that much remains to be done so that Europe can gather its strength and consolidate its gains, improve the movement of people and ideas, and, above all, develop a genuine overall strategy."

"The cooperative structures and procedures that Europe has managed to create over the last 30 years will have to be profoundly adapted to meet three imperatives. The first is the globalization of basic research; the second is opening up of the EC to both the EFTA [European Free Trade Association] and Eastern Europe; and the third is taking account of new social issues—and here I am thinking of health, with the spread of AIDS, and the environment."

"In entering a new stage of scientific development, it will be necessary to think of Europe differently. The EC's scientific and technological projects will be gradually transformed during this new stage. We will need imagination and dynamism to reform past institutional methods as we go beyond recent controversies and find new solutions to strengthen research and science."

European Science Policy Reform

"We must ask ourselves how to avoid the danger of stagnation that is now hanging over further EC development. Despite the current difficulties, Europe can and must remain the center of excellence—forged over the years—facing the other two world technological powers."

"The main objective of the Fourth Research and Development Framework Program now in preparation will continue to be the competitiveness of European industry. However, the program must still contribute to other EC policy areas which are closer to ordinary citizens: I have already talked about health and support for environmental policy. We should also include agricultural policies."

"We must do everything possible to avoid a situation where EC science policies are trapped in an excessively formal institutional approach, which would cause new problems rather than solve the present ones. Rest assured that I will be vigilant in this respect. The principle of subsidiarity will guarantee more democracy in decisionmaking and greater efficiency in management."

"Now is the time for us to prevent the further development—for the sake of European science—of a supranational administration superimposing itself on national organizations and existing cooperation structures. Let us simplify project implementation procedures and make them more efficient, while allowing national organizations and councils to help improve national policies and EC orientations. Let us accelerate decisionmaking by recognizing the councils' preeminence and reestablishing the atmosphere of confidence between the various institutions. Finally, let us explore to the full the various institutional formulas and approaches, depending on the fields of cooperation, the interests, and the capabilities of all involved."

"In my opinion, this is the only way that Europe can avoid its own fragmentation and remain a coherent scientific power, despite the membership of eastern European countries and the increasing globalization of basic research."

"National initiatives are a crucial factor in this approach. Naturally, I am planning, with your help, to continue and intensify the Europeanization and internationalization of French science."

"You are going to consider ways to ensure a truly European scientific solidarity through developing communications and researcher mobility."

France: New Research Minister Profiled

BR1305150493 Paris RECHERCHE TECHNOLOGIE in French Apr 93 p 3

[Unsigned report: "Francois Fillon, Minister for Higher Education and Research"]

[Text] Born on 4 March 1954 in Le Mans (Sarthe), Francois Fillon married Penelope Clarke (a Briton) in 1980. He is the father of four children: Marie, Charles, Antoine, and Edouard.

Studies

—1972: Baccalaureat [school-leaving/university entrance examination] in philosophy.

—1976: Master's degree in public law at the University of Maine (Le Mans).

—1977: Postgraduate research degree in public law from the Rene Descartes University.

Career

—1974: Work experience at the French AFP press agency.

—1976-1977: Parliamentary assistant to Joel le Theule, member of parliament representing la Sarthe.

—1978-1980: Representative of the cabinet of Joel le Theule, transport minister.

—1980: Representative of the cabinet of Joel le Theule, defense minister (in charge of relations with the French Parliament, the press, and universities).

—1981: Head of the legislative and parliamentary affairs department in the cabinet of Michel Giraud, minister of industry.

Elected Posts

—January 1981: Elected town councillor for Sable-sur-Sarthe, then deputy mayor, responsible for economic affairs.

—February 1981: Elected general councillor of la Sarthe [canton of Sable], then vice-president of the general council, responsible for economic affairs.

—June 1981: Elected representative of the RPR [Rally for the Republic] for la Sarthe, fourth district (youngest member of parliament).

—March 1983: Elected mayor of Sable-sur-Sarthe.

—March 1985: Reelected general councillor, chairman of the committee for economic affairs and tourism.

—March 1986: Reelected RPR representative for la Sarthe.

—June 1988: Reelected RPR representative for la Sarthe.

—March 1989: Reelected mayor of Sable-sur-Sarthe.

—March 1992: Reelected general councillor for the canton of Sable, then elected chairman of Sarthe General Council.

—March 1993: Reelected representative of la Sarthe.

Other Responsibilities

—President of the association "Sarthe Tomorrow."

Functions in the French National Parliament

—President of CASE, the Center for the Analysis of European Security.

—Former chairman of the Committee for Defense and the Armed Forces.

—Member of the Group for the Defense and Freedom of Education.

—Vice President of the French-Spanish Friendship League.

—Member of the bureau of the RPR Group.

—National RPR representative, responsible for defense matters.

—President of the French-Philippines Friendship League.

France: New Research Minister on Major Policy Objectives

BR1305125593 Paris RECHERCHE TECHNOLOGIE in French Apr 93 pp 1-2

["Editorial" by Francois Fillon, French minister for higher education and research]

[Text] By assigning both higher education and research to the same ministry, the prime minister intends to affirm the key importance, for the future of our country, that he attaches to cohesion between these two areas.

I consider it a great honor to have been given such a responsibility within the government.

The resulting convergence will enable us to highlight the affinities already existing between these two major national sectors.

In my first few weeks after taking office, I have decided to meet with the university presidents and leading representatives of French scientific research. My prime intention is to establish links with them—and through them, with the entire scientific and university community, thus laying the foundations of dialogue and mutual confidence, so as to enable me to embark on constructive reflection about the future. Admittedly, this government is taking over at a time when our country is facing the backdrop of recession, and the economic crisis sweeping through France and all the other industrialized nations will no doubt prevent us from guaranteeing budget increases as substantial as those from which we have benefited in recent years. However, I intend to lose no time in searching for the resources to see my designated priority actions come to fruition.

I also hope to mobilize the full capabilities of the officials working in my ministerial department, to contribute to the success of the government policy, and to reinforce the position of excellence that France occupies among the great scientific nations of the world. It will be a difficult task, but one on which I embark today with firm resolve and pragmatism.

Belgium: Technology Transfer Center at Louvain-la-Neuve

93WS0450B Brussels LE SOIR in French 27 Apr 93 p 20

[Article by Christophe Schoune: "UCL [Catholic University of Louvain]: A New Technology Showcase"—first paragraph is LE SOIR introduction]

[Text] Eighty million [Belgian francs] for an efficient research laboratory at Louvain-la-Neuve. Open Cesame [UCL Center for Systems Engineering, Automation, and Applied Mechanics]!

To provide for technology transfer between the industry and the university, under the best possible conditions. This is the key mission of Cesame, which just moved to its new premises in a brand new building. The "high tech" center was inaugurated Friday by Albert Lienard, minister of technological development, as part of the Walloon Technology Week. A training ground housing close to 80 researchers, this new technology showcase delights the officials of Cesame, which consists of two units of the UCL applied science faculty.

An Inter-University Attraction Pole (PAI) since 1990, Cesame developed privileged ties with four Belgian universities (KUL [Catholic University of Leuven], Gand, VUB [Flemish Free University of Brussels],

Namur). The pole of excellence is located in Louvain-la-Neuve. Modeling, simulation and control of complex systems lie at the heart of this partnership.

Distinguished "Customers"

Materially? Cesame has acquired international expertise in digital simulation and in process identification and control, which is indispensable in some industrial sectors. The field covers applied mathematics as well as physics, etc.

"One of the most interesting aspects of our collaboration with the industry is the financing of doctorates by multinational companies. It is advanced research that is published in the best journals. It helps science progress and can eventually be used by the companies," Marcel Crochet, a Cesame official, explained.

Agfa-Gevaert, Bell Laboratories, Philips, Shell, etc. Just a few names on a long list of "customers" that is indicative of Cesame's fame.

Grand Prix for Innovation

The last aspect of technology transfers to the industry, "spinoff" companies are the result of university research. For instance Polyflow, which employs 11 engineers. Located in the UCL scientific park, Polyflow developed a simulation program designed to analyze manufacturing processes involving flows. Used by some 100 companies and universities throughout the world, the program was awarded the grand prix for technological innovation in Wallonia in 1990.

Cesame's total budget, close to 150 million [Belgian francs] per year is divided into three equal shares: one-third from the UCL ordinary budget; one-third from research programs (PAI, FNRS [National Scientific Research Fund]); and one-third from contracts with companies.

Financed 60 percent by the Walloon Region, the new technology center (2,400 square meters of offices, meeting rooms, and laboratories) will cost 80 million [Belgian] francs and will include one floor (the second floor) occupied in part by Cesame.

"Thanks to our industrial contracts, our center will also enable engineers from companies to come here to get information," Marcel Crochet added.

Walloon Technology Facing the American or Japanese Giants?

"What matters, is that new advanced and competitive technology is being developed. But it would be a mistake to believe that centers like ours can go it alone, without the help of national and international partners..."

Germany: Problems With Research Structure in Northern Germany

93WS0454A Duesseldorf HANDELSBLATT in German 29 Apr 93 p 19

["Northern Germany Badly Needs to Catch Up: Major Structural Problems"]

[Text] *HANDELSBLATT, 28 April 93 hik BREMEN*— Government subsidized R&D is sorely underrepresented in northern Germany. Mostly fields that serve the public interest, rather than those directed toward industrial utilization, receive such support. In Bremen, particularly, R&D allocations in the general economy are far too small. In order to improve the industrial standing of large parts of northern Germany, considerable investments are needed to expand the R&D infrastrucvure. That is especially true for Bremen which is unable to afford the required expansion of the R&D infrastructure, estimated at about 1 billion German marks [DM] to the year 2002, out of its own resources.

This lamentable situation is the main point emphasized in a study produced by the economic department of the Bremen Committee for Economic Research [BAW] entitled "The Regional Importance of Bremen's Research Standing: Research and Development Compared in the Federal States," which will be published next week.

According to Werner Willms, the author of the study, this troublesome market detachment is demonstrated by the fact that in 1987 one-third, and in 1989 and 1990 one-fifth, of the project support resources provided by the Federal Ministry for Research and Technology [BMFT] for Lower Saxony went to nuclear power research. Likewise, the fact that in Schleswig-Holstein, one-third of the BMFT's financial support was directed to oceanographic research is another indication of the structural problems in northern Germany's research program. Again, according to Willms, only the polar and oceanographic research facilities in northern Germany benefits from institutional BMFT support. About three-fourths of direct project support funding goes to space research. This north-south asymmetry in R&D is also reflected in the fact that only six of the Fraunhofer Society's strongly tranfer-oriented institutes are located in northern Germany, while in Baden-Wuerttemberg alone, there are 14.

Willms sees major problems at two levels. First, northern Germany is disproportionally engaged in nuclear and space research (fields which are becoming increasingly subject to public criticism and cutbacks in funding), and which are too dependent on government subsidies and public contracts. Second, the structural effects resulting from the remoteness of these technical fields from the general market place, limit the economic development, especially of small and medium-size companies.

The study notes further that since the research capabilities of northern Germany are particularly concentrated in the eastern sector, Bremen assumes prime importance

for the economic development of the northwestern sector. Only this former Hanseatic city has "the infrastructural prerequisites to invite future projects aimed at economically interesting research fields." Surrounding areas would all profit from the sharpened economic competitiveness that would result from a reorientation of Bremen's research capabilities. Since the federal government remains exclusively bound to existing R&D capabilities and projects, a carefully engineered expansion of the R&D infrastructure is the main prerequisite for the acquisition of increased funding.

Characteristic of Bremen's R&D weaknesses, aside from the aforementioned problems, are the lack of dispositive industrial fields, the traditional dominance of but a few research-oriented industrial branches, and the great deficiencies in R&D transfer. More specifically, exchanges or transfers apparently do not occur at all between the large and the smaller enterprises. On the other hand, Willms credits the State of Bremen for having made considerable efforts to stop Bremen's detachment from the general development. Nonetheless, engineering sciences in the university have to be expanded further, and companies that are strong in R&D have to be encouraged to establish themselves up in Bremen. Because of the city-state's central position, the BMFT has to direct 4 percent (in 1990 it was 3 percent) of its support funding to Bremen. Finally, it is essential that the economy expand its under-average R&D activities and thereby lessen the region's dependence on federal support.

Netherlands: First 'Strategic Policy Document' Presented

93WS0455H Zoetermeer SCIENCE POLICY in English Apr 93 pp 6-10

[Article by Ineke Hommes: "The First Strategic Policy Document"; first paragraph is SCIENCE POLICY introduction]

[Excerpt] Where does the economic use of physical space end and the conservation of nature and the countryside begin?

Seven sectors of social concern dominate the new national strategy for scientific research: global changes, the economic structure, land use and the physical infrastructure, the environment and energy, human resources, social cohesion, and investment in culture. The strategy concentrates funding on research aimed at strengthening the economy, renewing the transport infrastructure, and protecting the environment.

The Strategic Policy Document, part of the Science Budget, is the result of a fact-finding study into the current potential of science and the demands of society, and a follow-up to the *Compass and Telescope* report, published by the Consultative Exploratory Committee (OCV) in October 1992. Both these documents have one inbuilt limitation: no matter how ambitious their goals, they are still only preliminary documents. The current Strategic Policy Document will be updated in 1995, at the time of that year's Science Budget. And a brand new Strategic Policy Document will be published in 1996.

Global Changes

Defence is one sector of social concern that is strongly affected by unexpected events. The Cold War may be over, but the new world order has not automatically led to greater security in Western Europe. The danger of a major offensive between the superpowers has given way to the risk of regional conflicts on ethnic, religious, and economic lines.

This change in the security situation has given rise to adjustments in Dutch defence policy, as outlined in the 1991 Policy Document on Defence: a new, leaner, military force will concentrate on peace-keeping missions, humanitarian aid, and crisis control. In addition, the Advisory Council on Military Production is currently studying the strengths and weaknesses of the Dutch defence industry. And plans are also afoot for improving coordination between military and civilian research in the form of "dual use."

The government's recent Policy Document on Development-Related Research emphasises the need for research programmes to boost home-grown research capacity in developing countries. Dutch research institutes will have to work more closely with institutes in donor and developing countries. And developmental programmes will have to respond to demand in developing countries rather than basing their efforts on supply.

Economic Structure

If the Dutch economy is to maintain its vitality and constant innovative edge, scientific input is indispensable. An essential component of this is more research in the natural sciences and technology. The business community will have to show more commitment to research in these fields and there is a need for more coordination between the scientific infrastructure and the economy.

Microelectronics

From 1986 to 1990, the Dutch government spent an extra 83 million guilders on research and higher education, under the Micro-electronics Action Plan. It initially concentrated on fundamental research into semiconductor technology. However, the OCV now believes that the current state of microelectronics demands a clear shift away from fundamentals to systems and software research. The decline in the importance of fundamental technological research is largely due to restructuring in the computer industry (witness the developments at Philips). The Netherlands Organisation for Scientific Research (NWO) is to set up a committee with members drawn from both the scientific and business communities, which will formulate funding criteria and evaluate research proposals.

Materials

In 1991, the Advisory Group on Materials (AGM) published its recommendations for industry, education, research, and the environment. In the AGM's opinion, research into polymers, metals, and functional materials

would benefit from an increase in government support. The Group would also like to see existing applied research into metals and ceramics concentrated in a strong national centre, which would serve as a bridge between scientific theory and industrial practice. The expansion of research and restructuring recommended by the AGM will be financed from university research funds.

Research into polymers is vitally important, as is (to a lesser extent) metal research.

An NWO programme committee will evaluate proposals for materials research from universities, and will hold consultations on the expansion and management of the materials research it already funds. The Ministry of Education and Science will also make a contribution to this programme over a number of years.

Biotechnology

Biotechnology is a particularly promising field for the industrial future of the Netherlands because of the great breadth of its potential application in agriculture and industry. The OCV believes that biotech research should be firmly rooted in a small number of world-class centres. Last year, the NWO presented a plan for the establishment of the Association of Biotechnological Centres. Research centres and universities will formulate this plan in more detail. In the next five years, the NWO, the Ministry of Education and Science, and the Ministry of Economic Affairs will jointly make another 20 million guilders available for biotech research.

Agriculture

One of the most distinctive features of the Dutch economy has long been agriculture. In almost all agricultural fields, care for the environment requires new systems and processes. Agricultural research was dealt with in detail in the Policy Plan for Science and Technology for 1991-1994, published by the Ministry of Agriculture, Nature Management and Fisheries.

The National Council for Agricultural Research (NRLO) plays a key role in conducting fact-finding studies in agriculture. In the OCV's opinion, the future of agricultural education in the Netherlands needs a detailed review. The Committee points to the possibility of a European agricultural university. It also supports the further redistribution of responsibilities and continuing cooperation between Wageningen Agricultural University and other universities. The Ministry of Agriculture also intends to make 10 million guilders available for the foundation of a number of research institutes over the next four years. The level of cooperation among these various institutes will be a criterion for funding.

The Strategic Policy Document also emphasises the importance of harnessing the basic disciplines of physics and chemistry to help strengthen the economy. Physics is the scientific basis for a whole array of subdisciplines in technology, the natural sciences, and the life sciences. Phenomenological physics is a growing subdiscipline, although—according to the Biophysics Exploratory Committee—it still has some catching up to do. Some areas of physics are served by international facilities such as CERN (European Organisation for Nuclear Research). One problem is that the costs, though shared among many countries, are very high. A document recently published by the Foundation for Fundamental Research on Matter (FOM) contains goals for various areas of physics, prominent among them being plans for nuclear physics facilities. However, 6 million guilders are to be cut from the budget for subatomic physics, to which nuclear physics belongs. In addition, the Amsterdam Pulse Stretcher facility at the National Institute for Nuclear and High-Energy Physics (NIKHEF) in Amsterdam is to close in 1998. The OCV is planning a detailed review of the whole field of physics.

In 1991, the chemical industry accounted for 15 percent of all industrial output, three-quarters of which was exported. What is more, chemical research is a crucial instrument in the quest for ways of preventing and solving environmental problems. The Royal Netherlands Academy of Arts and Sciences and the OCV have together commissioned a fact-finding study of chemical research and technology.

Land and Water Use

Where does the economic use of physical space end and the conservation of nature and the countryside begin? The physical infrastructure occupies the attention of three ministries: Housing, Planning and Environment; Agriculture, Nature Management and Fisheries; and Transport, Public Works and Water Management.

The Strategic Policy Document examines land and water use. Land, road, and water infrastructures all need constant modernisation; soil must be protected and renewed; dikes have to be rebuilt; and now, underground construction is a priority. Dutch hydraulic engineering research is internationally renowned. The Netherlands Centre for Coastal Research promotes fundamental research into the physical workings of coastal systems.

Research in the field of nature and the countryside focuses on conservation, restoration, and development, with the emphasis on quality. One of its current priorities is the interaction between recreation, the natural environment, and the development of regional products. In 1993, the NWO's Institute for Community Development and Physical Planning (SRO) is to launch a programme, which will begin with a small number of research projects on developments in tourism and recreation. In addition, the National Council for Agricultural Research is to conduct a fact-finding study into the sustainable development of agriculture in the Netherlands in the 21st century.

Land and water use are set to attract more and more interest in the future, especially in view of the increase in air traffic, the introduction of high-speed railways, and the launch of the European Network of Protection Areas

(EEHS). From 1993 to 1995, the OCV will identify areas for long-term and fundamental research in the fields of traffic, transport, and infrastructure. Research institutes, companies, and government agencies will be responsible for its implementation.

In 1993, all departments of the Ministry of Transport, Public Works and Water Management responsible for research into inland transport are to be combined in the Advisory Service on Transport and Communications (AVV). Ad-hoc studies will give way to a more strategic and innovative approach to research. In addition, a new research institute may be dedicated to this field.

A number of factors dictate against modernisation in the maritime field. Many small transport and shipping companies lack the money to take advantage of research and development projects. In addition, there is not enough multidisciplinary research into storage and transshipment. Yet investment in these areas is crucial if the Dutch transport sector is to remain competitive. An advisory report is to be published in mid-1993, containing policy recommendations.

In the past 10 years, there has been a surge of social and political interest in global environmental change. The realisation has grown that, unless radical policy changes come fast, current rates of economic development, population growth, raw-material consumption, and environmental pollution will inevitably combine to wreak global disaster. This realisation has become a factor in determining Dutch policy on long-term energy research. We urgently need to reduce waste production and to step up our quest for fuels that are ecologically less harmful.

A wide range of energy research is currently in progress, but there is little synergy in the field. The 1991 Science Budget argued the case for a university-based centre for energy research, and this wish is to be fulfilled; such an institute is in fact to be launched in 1993.

A research centre is to be opened in Utrecht, to strengthen fundamental research into the global climate. A programme bureau is to be launched in 1993 to coordinate research into land-ocean interaction in coastal areas. The Minister of Education and Science has earmarked several million guilders from the Science Budget for both centres to attract international facilities.

A third initiative is the foundation of a Global Change Bureau in the Netherlands, announced in the Policy Document on Climate Change published by the Ministry of Housing, Planning and Environment in 1991. The Bureau is intended to serve as a national consultative body. Details of its duties, location, and funding will be announced later this year.

In 1991, a committee observed that research into environmental economics was underdeveloped and fragmented in the Netherlands. This field is now about to receive a large increase in funding as a result of a structural shift in the overall funding of university research. The Advisory Council for Research on Nature and the Environment (RMNO) is to set up a programme to improve research in the field. In addition, the NWO has added environmental economics to the *Ecozoek* foundation's remit.

In autumn 1992, five ministries launched a joint Research Programme for Sustainable Technological Development. Following the Policy Document on Technology and the Environment (April 1991), which identified technological developments of potential importance to the environment, the Interdepartmental Working Group on Technology and the Environment announced that it was to conduct a fact-finding study into the area.

There is a growing realisation that the social sciences also have a great deal to contribute in the environmental research sector. Accordingly, the Environmental Research Council is to collaborate with the Social Science Council and the NWO in investigating where improvements need to be made and in devising a research agenda. In addition, the NWO has set up a Multidisciplinary Programme on Sustainability and Environmental Quality, whose remit will include social-scientific problems. [passage omitted]

EC: ETSI Adopts Intellectual Property Rights Policy

93WS0465C Maidenhead TELEFACTS in English May 93 pp 4-5

[Article by Rachel Colyer: "ETSI Adopts IPR Policy and Undertaking"]

[Text] An Intellectual Property Right (IPR) Policy and Undertaking has been adopted by the ETSI General Assembly. This is an important step towards reconciling the rights of IPR owners with the need for everyone to have access to European standards. ETSI reported that the outcome of the vote was "considerably better...than most observers had expected" in view of the controversial issues at stake; following an 88 percent weighted vote of individual members, a further vote on a country constituency basis resulted in 100 percent of weighted votes in favor of adopting the agreement, with one abstention.

With the large number of European Telecommunications Standards that are now referred to in EC legislation, ETSI maintained that existing approaches, such as that of the International Standards Organisation for Standardization (ISO), while still valid in other fields, could not cope with the situation in the European telecommunications field.

From 1 November 1993, signing the Undertaking will become a condition of membership of ETSI. Members will be able to declare that a specific IPR is not available to the standardization process. If no such declaration is made within 180 days, a member will be required to grant licenses to ETSI members and non-members, wherever the standard is applied, "on fair, reasonable and non-discriminatory terms."

First Franco-German LEA Laboratory Created

93WS0471A Paris AFP SCIENCES in French 22 Apr 93 pp 1, 2

[Article: "Creation of First Franco-German Joint European Laboratory in Former GDR"

[Text] Paris—The CNRS [(French) National Center for Scientific Research], the Max-Planck-Gesellschaft [MPG], the Louis-Pasteur University at Strasbourg, and the European School of Higher Studies of the Chemical Industries [EHICS] have teamed up to create an LEA [Joint European Laboratory] in the new German land of Saxony-Anhalt (the former GDR [German Democratic Republic]) for the study of the magnetism of surfaces and interfaces.

The agreement creating this joint undertaking was signed on 15 April at Halle by the general manager of the CNRS, Francois Kourilsky; the president of MPG, Hanz Zacher; and the president of the Louis-Pasteur University, Adrien Schmitt; in the presence of the land of Saxony-Anhalt's secretary of state for scientific research, Professor Freye, and the ambassador of France to Bonn, Bernard Dufourcq.

Mr. Zacher termed this agreement "an important initiative for the construction of the Europe of science." Mr. Kourilsky said that this decision "responds to a need among the scientists, and underscores the fact that European science is not decided solely in Brussels or in Strasbourg, but wherever researchers want to organize and work together." Mr. Dufourcq, for his part, remarked that the creation of this new laboratory is an event of scientific, psychological, but also political importance.

The laboratory brings together the Max-Planck Institute for the Physics of Microstructures group, headed by Professor Jurgen Kirschner; the Strasbourg Institute of Physics of Materials, headed by Jean-Paul Deville; the Louis-Pasteur University; and EHICS. The field in which they will be working together is one in which the stakes are of rising economic and fundamental importance, that of the new magnetic materials based on artificial structures fashioned at a mesoscopic (subatomic) level, and used in the fields of sensors, recording, and magnetic reading. The LEA will utilize the complementarities of LURE [Laboratory for Use of Synchrotron Radiation] synchrotron radiation sources at Orsay, and BESSY [Berlin Electron Storage Ring for Synchrotron Radiation] sources in Berlin.

French Space Agency Now Under Three Ministries

93WS0471B Paris AFP SCIENCES in French 22 Apr 93 pp 5, 6

[Article: "CNES Under Three Ministries"]

[Text] Paris—The CNES [National Center for Space Research] has been placed under the joint oversight of three ministries: the Ministry of Industry, Posts and Telecommunications, and Foreign Trade; the Ministry of Defense; and the Ministry of Higher Education and Research, under a Decree of 8 April published in the JOURNAL OFFICIEL of 9 April.

In the previous government, authority over all space activity—after having long been assigned to the Ministry of Posts and Telecommunications, then to the Ministry of Equipment, Housing, and Transportation, under Paul Quiles—was assigned to Mr. Hubert Curien, who then, in April 1992, became minister of research and space. But recently, based on the decision to combine civil and military space activities, the CNES was placed under the minister of research and space and the minister of defense, in order to achieve the coordination and coherence desired at the highest echelon of state.

The Decree of 8 April provides that "the authority previously delegated to the Ministry of Research and Space in the realm of space" is exercised by the Minister of Industry, Posts and Telecommunications, and Foreign Trade. The French space function, therefore, will henceforth probably come mainly under Mr. Gerard Longuet.

The CNES Administrative Board is chaired by Mr. Rene Pellat. Its general director is Mr. Jean-Daniel Levi. For 1993, the CNES has a budget of 11.66 billion French francs [Fr], 47.67 percent of which is earmarked for French participation in ESA [European Space Agency] programs, far outweighing the allocations to national programs (20.4 percent), technical support of programs (14.6 percent), and programs being realized in bilateral cooperation with the United States and particularly the Russians (5.2 percent). The military space function delegated to it will bring with it between Fr2 and Fr2.5 billion annually.

EC: JESSI-U.S. Sematech Program Cooperation Said 'Difficult'

BR2605110493 Paris ELECTRONIQUE INTERNATIONAL HEBDO in French 22 Apr 93 p 6

[Article signed D.G.: "Coordination of EC JESSI, U.S. Sematech Programs Difficult"]

[Text] Joint JESSI (Joint European Submicron Silicon Initiative)-Sematech research programs remain confined to the "automated control of silicon wafer treatment." A shared terminology has recently been adopted.

Cooperation between the European JESSI and the U.S. Sematech programs is proving difficult. According to Paul Davis, responsible for the European arm of SEMI, "cooperation between the programs will remain difficult as long as attitudes among the industrial partners remain the same and until a joint financing agreement has been reached." The Sematech program, planned over a 15-year period, was recently presented by the American Semiconductors Association and covers areas of research already planned for by JESSI.... Even so, the budget restrictions affecting both Europe and the United States

should encourage cooperation. JESSI's 1993 budget ($443 million) is lower than in 1992 and in terms of [semiconductor] manufacturing equipment, synergies [with Sematech] do exist. The Europeans have specialist knowledge in the field of photolithography and wafer steppers and the Americans in deposition and etching.

In practice, however, cooperation within the framework of the AUTOWEC (Automated Wafer Environment Control) program remains limited. An agreement covering the terminology employed in mini-environments has just been signed by Sematech and JESSI. A number of terms have been defined: mini-environment, active mini-environment, integrated mini-environment, box, cassette, functional unit (pod), standard mechanical interface (SMIF), and input/output component.

Netherlands: Biotech, Computer, Environment, Materials Projects Funded

BR2105143193 The Hague ECONOMISH ZAKEN in Dutch 29 Apr 93 p 4

[Unattributed article: "More Than 100 Million Dutch Guilders Awarded to PBTS, Industry-Oriented Technology Promotion Program, Scheme"]

[Text] The PBTS [Industry-Oriented Technology Promotion Program] has entered a new phase. In 1993, it will concentrate on four fields: biotechnology, information technology, materials technology, and environmental technology. Each field is eligible for a grant from Senter.

The Ministry of Economic Affairs is making a total of 108 million guilders available for the four PBTS fields. The program is being run by Senter, an independent division of the Ministry of Economic Affairs. Brochures outlining the objectives and describing the projects have been produced for each of the technological fields. They also contain application forms which will be used by Senter to judge whether the project proposals are comprehensive. Subsequently, a board of external experts will evaluate the content of the project proposals, prioritize them, and make recommendations to the minister of economic affairs. Grants will be awarded in decreasing order of preference until the budget has run out. For all four PBTS segments, the maximum grant to be allocated is 37.5 percent of the approved project costs.

Biotechnology

A total of 18 million guilders is available this year for biotechnology. The money will be allocated to research projects aimed at widening the implementation of biotechnology in Netherlands industry. There is particular interest in the contribution which biotechnology can make to long-term industrial and agricultural applications. Likewise, collaboration between companies and/or research institutions is being encouraged. The closing date for submitting grant applications to Senter for PBTS-Biotechnology is 14 June 1993.

Information Technology

A budget of 17 million guilders is available for this PBTS segment. The aim of the PBTS-Information Technology program is to strengthen the competitive position of Netherlands companies by promoting information technology applications in products and services. Information technology in this respect implies the entire range of scientific and technical know-how with regard to data collection, storage, processing, retrieval, and communications. The closing date for submitting grant applications to Senter for PBTS information technology is 28 June.

Environmental Technology

The largest amount of money (38 million guilders) in the 1993 PBTS scheme is reserved for environmental technology. This segment aims to promote the development of environmentally clean technologies, to raise the environmental awareness of the business community, and to encourage the implementation of existing know-how and technologies by industry. The closing date for submitting project applications to Senter for PBTS-Environment is 1 July.

Materials Technology

This PBTS segment will receive 35 million guilders. The money is intended for research into new and improved materials and their application in industrial products or other areas of industry. In addition, this segment also offers particularly favorable conditions for cooperation agreements between companies, as do the biotechnology and environmental technology segments. The closing date for submitting project applications to Senter for PBTS-Materials Technology is 17 May.

JESSI's 0.5-Micron Technology Commercially Available

BR2105143693 Paris ELECTRONIQUE INTERNATIONAL HEBDO in French 6 May 93 p 25

[Unattributed article: "European 0.5-Micron Technology"]

[Text] The 0.5-micron technology developed under the JESSI [Joint European Submicron Silicon Initiative] program is now available to services companies, small- and medium-sized businesses, and universities.

The European JESSI microelectronics program has been yielding its first results: Now available is the technology for the production of integrated circuits with 0.5-micron line widths. This decision was made by the project participants (SGS-Thomson, Siemens, Philips Semiconductors, GEC Plessey Semiconductors, Temic, Matra MHS, and Mietec) when they last met with the JESSI board. The 0.5-micron technology, which springs from a project called CMOS [Complementary Metal-Oxide Semiconductor] Logic, will be made available to engineering services companies, small- and medium-sized

businesses, and universities. According to the JESSI board, Europe has now caught up with the United States and Japan as far as this technology is concerned. In the meantime, integrated circuit manufacturers and semiconductor equipment suppliers have decided to strengthen vertical cooperation along the whole production chain.

CORPORATE ALLIANCES

Germany: New Alliances in Machine Tools Industry

93WS0424A Duesseldorf VDI NACHRICHTEN in German 19 Mar 93 p 12

[Article by Juergen Salz: "Change of Partners in Mechanical Engineering; Maho Now Aiming for Closer Partnership—With Deckel?"—first paragraph is VDI NACHRICHTEN introduction]

[Text] Machine tool manufacturers Maho and Traub have let their joint venture break up. Both companies are looking around for new partners: Traub is now working with Hermle while Maho may be cooperating with Deckel.

In December of last year both machine tool manufacturers, Maho of Pfronten and Traub of Reichenbach/Fils in Wuerttemberg, had paid tribute to their just agreed-on joint marketing venture as "an alliance that is certainly exemplary for the whole industry." But just two months later, in February of this year, Maho again dissolved the association. Traub has already found a new partner: Last week the company announced cooperation with Hermle, Inc., of Gosheim/Wuerttemberg—on sales, possibly also on purchases, and both Baden-Wuerttemberg machine tool manufacturers want to cooperate with each other on production.

Maho must have had good reasons for breaking up the joint venture with Traub: "There are options in another direction," a spokesman for the Pfronten company remarked. A "further-reaching joint venture," he said is in preparation. There is every reason to believe that Maho will soon reach agreement with its Munich competitor, Deckel, on close cooperation. We can, of course, think of other possibilities too—but, in the opinion of company advisers, the search will hardly end in cooperation with a Japanese manufacturer.

Cooperation between both former arch-enemies, Maho and Deckel, both of which manufacture milling machines and drills, would make perfectly good sense: Since Maho has to use its oversized plant in Kempten to full capacity, a plant that was built only a few years ago, production in the new plant is at present only used to 40 percent of capacity. In theory, two-thirds of the worldwide milling machine market could be supplied by the Kempten plant. It is a good thing that major Deckel stockholder Walter Eder has already considered whether Deckel is not spending too much for production at its location in the southern part of Munich. As an alternative, he may also have in mind the "use of already existing production plants with other companies." A joint venture between both companies would probably also have resulted in the closing down of production plants.

With sales the situation appears to be different since Deckel is already involved in a joint marketing company with its competitor in Bielefeld, Gildemeister. "As far as marketing is concerned, Deckel and Gildemeister are currently out of the running as joint venture partners," Dr. Bodo Viets, the new chairman of the board of Maho remarked only last December.

Maho and Deckel have much in common. Both produce in Bavaria, both manufacture milling machines and drills, and, above all, the German Bank and the Bavarian Union Bank are behind both companies. In Maho's case a bank pool under the management of the German Bank, in which the Bavarian Union Bank also participates, has held a majority of the shares since the stockholders' meeting last December. German Bank chairman of the board Rolf E. Breuer is the chairman of the Maho supervisory board. In Deckel's case, on the other hand, both financial institutions are among its biggest credit providers.

The banks will press them for solutions to the problem since the financial institutions have already had to abandon claims in the two-figure millions against Maho as well as Deckel. With Maho the loss of DM157 million in fiscal year 1991-1992 already represented more than a third of the company's sales volume of DM442 million. The situation is similar with Deckel: Chairman of the board Peter-Juergen Kreher expects a loss of DM75 million for 1992 with a sales volume of DM290 million. There is no improvement in sight: The Association of German Machine Tool Factories (VDW) anticipates a further drop in production of more than 10 percent for the entire industry.

New partners Traub and Hermle will also be in the red in 1992. For Hermle the reason for cooperation in marketing is especially to improve its poor export business. The Wuerttemberg company currently obtains only 22 percent of its already declining sales volume (January-October 1992: DM70 million) from exports. Hermle has special problems in Switzerland. In the opinion of the Swiss Metal and Watch Industry Employees Union (SMUV), bankruptcy is unavoidable for the local Hermle subsidiary, Aciera, Inc., since its order books are completely blank.

Traub, on the other hand, has high hopes of fuller utilization of its foreign marketing network through cooperation with Hermle, a network through which Hermle machine tools will also be sold in the future. Ex-partner Maho is also stepping up its activities abroad. In early March the Pfronten company signed a licensing agreement with Jinan First Machine Tool Works of China.

DASA-Fokker Group Discusses Restructuring European Aeronautics Industry

93WS0447A Paris LE MONDE in French 29 Apr 93 p 20

[Article by Christian Chartier: "After Celebrating Their Marriage, DASA and Fokker Would Form, With Aerospatiale and Alenia, a European Aeronautical Powerhouse"]

[Text] The Hague—At the signing of the contract, in The Hague, formalizing Deutsche Aerospace's [DASA's] acquisition of 51 percent of the capital of the Netherlands' Fokker company, the presidents of the two companies expressed the ambition of "restructuring the European aeronautics industry." Juergen Schrempp, for DASA, and Erik-Jan Nederkoorn, for Fokker, referred to their marriage as the cornerstone of a basic European aeronautical structure that France's Aerospatiale and Italy's Alenia would be expected to join.

"The idea is that they would become shareholders in the holding company" created to manage participation in Fokker, said the president of DASA. Talks, he said, are to begin on setting the time table for this joint effort, and on its "industrial concept." Louis Gallois, president of Aerospatiale, responded immediately that he will "decide on the basis of the interest" of the ATR [Regional Transport Planes] consortium.

Fokker's president expressed the view that, "Over the last three years, the airline companies have lost the $11 billion they had earned in the preceding ten, and the aircraft manufacturers are suffering the consequences. The era of national manufacturers has ended." The European manufacturers, all of whom are hurting, must unite their technological, industrial, and commercial potentials in order to play a game that has become global and that "the Japanese and other Asiatic competitors will not be long in joining."

Fokker has now sewed up its reorganization plan. The company's management and the unions have reached agreement on the laying off of 1,395 salaried employees between now and the end of the year. This figure is 394 units less than that of the restructuring plan presented in March (LE MONDE 27 March). But the full extent of the reorganization, which was a prior condition to the entry of DASA, has not been confirmed: Fokker will have to lose 2,118 persons, or 17 percent of its staff.

The unions have simply negotiated sacrifices that will make the reduction in staff more tolerable as to form but no less drastic as to content: It will take the form of a reduction of the workweek from 38 hours to 36, an expediting of the retirement of employees over age 55, and an increase in the sharing of work. The restructuring will also entail a freezing of salaries at their present levels until 1 January 1995, and the elimination of certain bonuses until that date.

EC Approves Philips, Thomson, Sagem Flat Screen Venture

BR1305105693 Paris ELECTRONIQUE INTERNATIONAL HEBDO in French 6 May 93 p 13

[Unattributed article: "Brussels Gives Go-Ahead to Philips, Thomson, Sagem Flat Screen Alliance"]

[Text] The EC Commission has given the go-ahead to the creation of a joint venture involving Philips, Thomson, and Sagem in the area of active-matrix liquid crystal displays.

The company will be named "Flat Panel Display BV" (FPD). According to the terms of the agreement reached by the three companies last November, 80 percent of the stock will by held by Philips and 10 percent each by Thomson and Sagem. Opening up FPD's capital to other companies is still being considered.

CORPORATE STRATEGIES

France: Microwave IC Manufacturers Target Civil Markets

93WS0397A Paris L'USINE NOUVELLE TECHNOLOGIES in French 18 Mar 93 p 26

[Article by Isabelle Vautier: "The MMICs [Monolithic Microwave Integrated Circuits] New Orientation"—first paragraph is L'USINE NOUVELLE TECHNOLOGIES introduction]

[Text] Relying on their experience in military applications, manufacturers no longer hesitate to develop customized MMICs for consumer products.

Hard hit by drastic cuts in military budgets, microwave component manufacturers diversify their catalogs to include both telecommunication and consumer products. To better adjust to these markets, some exhibitors at the Microwave Show held at the Convention Palace in Paris at the end of January are developing customized MMICs.

Thus, while still selling its standard products, Thomson-CSF Application-Specific Semiconductors (TCS) opens the doors of its silicon foundry to manufacturers with the multiproject gallium-arsenide (GaAs) MMIC process. The service is available for low-noise all-purpose applications up to 20 GHz, and for power circuits up to 10 GHz. It includes three days of instruction in design and drafting rules, one set of masks, and the manufacturing of mounted and measured chips on metal-alumina chip carriers.

Dassault Electronics also offers the knowhow of its GaAs monolithic-circuit design department to design and develop a range of customized functions. It has mastered a wide range of processes, which enables it to choose the

technologies best suited to the work specifications. On the other hand, it does not have internal production means.

For its part, Philips Microwave Limeil (PML) offers six processes available in foundry. They make it possible to manufacture high-density digital/analog GaAs circuits and traditional microwave circuits. PML also announced the availability of its millimetric process for prototype MMICS up to 80 GHz! Called D02AH, the process uses transistors with a 0.2-micron gate length; it should be transferred to the silicon foundry by the end of the year. Studies have already started, in particular for satellite television and automobile-related applications, such as automatic toll recording or radar assistance to braking based on the vehicle speed.

UK's ICI Considers Restructuring

93WS0397B Paris COMPOSITES ET NOUVEAUX MATERIAUX in French 12 Mar 93 p 8

[Unattributed article: "Major Problem for ICI [Imperial Chemical Industries] as it Attempts to Restructure"]

[Text] At the end of February, the British chemical manufacturer published its worst results in 10 years. To try and straighten out the situation, the management just proposed to split the group. If the idea is approved, the split should take place early in June: on the one hand, Zeneca, the company covering the high value-added activities of the ICI group (from pharmaceuticals to specialty chemicals, and including pesticides and seeds); on the other hand, ICI, the chemicals manufacturer. Although not fully official, this split has been effective in practice since 1 January. Layoffs are also expected: 2,000 at Zeneca, 7,000 at the new ICI.

We should mention that taxable profits dropped by 28 percent, to £565 million, which means that they were divided by three in three years. ICI's net loss after taxes and non-recurring items amounted to £570 million. By forming smaller structures, the group hopes to react quicker to market variations. The measure is also aimed at the stockmarket. The management hopes that the split will enhance the image of Zeneca's activities, leading to a stockmarket price nearly equivalent to that of the former ICI. If the chemical part of the new structure still looks shaky, Zeneca too is showing cracks. During the eighties, the ICI pharmaceutical division performed brilliantly due to its new drugs against cancer and certain cardiovascular diseases; but its patents are getting old now. The patents for its bestseller, Tenormin (42 percent of its 1991 sales), are expiring, making room for competition, cheaper generic products. As a result, benefits from drug activities declined by 8 percent last year. However, according to the American analyst Hermant Shah, Tenormin should be succeeded by the division's latest drug, Casodex, developed to treat cancer of the prostate...

European Auto Industry Wants EC Support for Market-Oriented Research

93WS0421A Duesseldorf VDI NACHRICHTEN in German 19 Mar 93 p 6

[Article by Wolfgang Mock: "Automobile Industry Seeks Help From the EC;" initial paragraph is VDI introduction]

[Text] The European auto industry wants to break an old taboo. High-ranking automobile executives are contemplating what a cooperation between their companies might look like even in the applied sector. The EC commission is to pave the way for it.

The then president of the Association of European Automobile Manufacturers (ACEA) and the designated head of Mercedes-Benz AG, Helmut Werner, were hesitant to let the cat out of the bag: "What we need are opportunities for research cooperation not just in the pre-competitive field."

A decline in sales ranging from 25 to 40 percent over the last few weeks, compared to the months of February and March 1992, greater Japanese import pressure, large-scale layoffs and growing economic difficulties mark all of the European auto industry at this time.

Sales by European manufacturers this year will drop by more than 1 million cars, the ACEA estimates, a loss of 7.9 percent compared to 1992.

The European auto industry is still a key industry for Europe. It employs well over 1.8 million people at the car makers and the suppliers, about 8 percent of all industrial jobs. According to the ACEA's information, the capital appreciation of the European auto industry last year exceeded ECU65 billion (1 ECU = 1.96 German marks), 32 percent of its production value. The investment efforts are enormous: more than ECU12 billion annually.

Until now the European auto industry has been very hesitant to participate in pre-competitive joint research projects. Within the framework of the third EC research program (1990 to 1994), not even ECU60 million a year went to supporting the European auto industry.

This is clearly too little for the representatives of the European auto industry. According to a spokesman from the ACEA, we have "supported the EC's agreement with the Japanese about imports of Japanese cars, but now the EC must also keep its promises."

At the end of 1991 Japan and the European Community agreed to impose a quota on the import of Japanese cars into the EC nations until the end of 1999. During this period of time the number of direct imports from Japan was to be limited to 1.23 million cars annually.

At the same time the EC commissioner in charge, Martin Bangemann, announced that the EC's research spending for the automobile sector should be "increasingly aimed

at the actual and concrete needs of the market" and, furthermore, more than previously promote professional education within the auto sector.

So far, the ACEA is heard to say, "nothing has happened there yet." And Werner complained in Brussels that "it is still difficult for European automobile manufacturers to obtain public support for those research projects which extend to applied research and development."

Werner therefore demanded in Brussels:

- that the auto industry should be able to join together more than before on research projects without being prevented in doing so by increasingly incomprehensible national and EC competitive regulations;
- that the auto industry should expand its cooperations more than it has to the field of development and
- other branches of industry, such as electronics as well as medium-sized companies and research institutions, should be included in these research projects.

An ACEA employee comments on Werner's demands that "at the moment nothing is happening on the part of the EC. Although the competition is plainly taking place between the triads, we in Europe are still far away from a joint automobile market."

The criticism from the auto industry is not so much aimed at insufficient funding as primarily at the existing regulations governing competition. "If Porsche, Mercedes and VW get together for a development project, they automatically have difficulties with the cartel control. And at the EC level it is the same thing."

There is also criticism of the principles of the EC support, which basically permit competition only in a pre-competitive environment. Thus, Werner as well joins in the complaints now heard from many important European industries, that the lack of suitable European innovation programs has developed into "a tremendous disadvantage in turning product-oriented research results into application."

Such an orientation for the EC research funding failed primarily because of the EC's competition policy. The message to the auto industry from the EC commissioner in charge of merger control until the end of last year, Leon Brittan, was clear: "The further the cooperations between the car manufacturers are removed from the market, the better I like them." ACEA representatives describe this as a "dated position" and hope that the EC commissioner who has been responsible for EC competitive policy since the beginning of this year, Karel van Miert, will display a "more realistic judgment."

But even then the EC research politicians would still have to be won over for the automobile industry's goals. Werner concludes: "In the EC's budget greater weight must be given, when distributing the support funds, to the fields of strategic importance and those important from the aspect of competition policy." He demands major, strategic research programs with a defined goal primarily when the development risk becomes too great for individual enterprises.

The electronics and aviation industry have already presented similar demands.

Such goals are anything but beloved by the EC commission, to be sure. Representatives of Germany and Great Britain, as well as the smaller EC member nations, have always bristled in the Council of European Research Ministers at giving up the pre-competitiveness principle for research support.

The financial problem for applied research is likely to get increasingly serious. So far there is little funding to enable the financing of applied prototypes in selected cases. Even high-ranking EC officials today admit that a restructuring of the EC support programs in the direction of major strategic and, above all, applied projects can hardly be implemented politically. "But even if that were cleared up," according to an EC representative, "where is the money going to come from?"

France's Bull Group Said to Be Faced With Long-Term Crisis

93WS0431A Duesseldorf VDI NACHRICHTEN in German 9 Apr 93 p 11

[Article by Christoph Mohr: "France's Computer Maker Facing Long-Term Crisis. Bull—a Company Receiving an Infusion From the Government. Large Loss Again in 1992 Also"]

[Text] Paris, 9 Apr 93 (VDI-N)—The French government-financed computer maker Compagnie des Machines Bull concluded fiscal year 1992 with a new record loss of 4.72 billion French francs [Fr] (approximately 1.5 billion German marks [DM]). The loss is markedly higher than expected at any rate and continues the series of operating results deep in the red for the stricken company. Bull had a net loss of Fr3.3 billion in 1991, and of even Fr6.8 billion in 1990. Bull maintains that the operating loss of the previous year of Fr1.5 billion was halved to Fr700 million and that the large net loss is attributable to very large accrued liabilities (Fr2.45 billion). "The figures are worse than the actual situation," Bull President Bernard Pache opines.

For Bull is finding fewer and fewer buyers. Sales in 1991 fell by 3 percent to Fr33.45 billion, and then they dropped in the last fiscal year still again by 9.8 percent to Fr30.19 billion and thus below the level of 1988. Sales of computers dropped by 15 percent to Fr16.4 billion. The remaining divisions remained approximately at the level of the year before at Fr13.8 billion (- 1.3 percent). Bull holds losses on exchange responsible for a third of this drop.

The question of the future of the company that once was meant to be a symbol of France's national independence in a key technology obviously looms behind the red

numbers. The surprising dismissal of Bull President Francis Lorentz in the summer of last year, who had to pay the penalty for his opposition to the industrial policy ideas of former government head Edith Cresson, intensified still more the uncertainty concerning the future company line and the policy ideas of the principal stockholder, the government. Lorentz was considered the driving force in the restructuring of operations and the architect of international alliances with the Japanese NEC Corp. and IBM. Both companies acquired a low-level equity share. IBM has a 5.68-percent share in Bull today, and NEC Corp. a 4.43-percent.

Lorentz's less distinguished successor Bernard Pache, who made a name for himself in complicated cases of the restructuring of operations in the coal sector, appears to be banking on continuing the line begun. The high accrued liabilities on 1992's balance sheet suggest additional personnel cuts. Three thousand permanent layoffs are expected for this year, after Bull has already cut over 11,000 jobs since 1990.

But not just rationalization measures, but also strategic approaches are now being advocated at Bull. In mainframe computers Bull, which earned itself a good reputation as a provider of complete system solutions in the field of management and banking, for one thing, has clearly lost its technological independence today. Without the alliance with IBM, whose superfast RISC processors are functioning also in Bull computers today, the French company would have lost technical contact. It is therefore only logical also that Bull at the beginning of the month joined the alliance of IBM, Apple and Motorola arranged by Intel. Consequently, Bull will be able to use in the future too the PowerPC chip developed by IBM and Motorola, which the two introduced for the first time in October of last year.

It is also uncertain what will become of the PC division. Bull wanted to get itself a foothold here with the buyout of the US Zenith Data Systems (ZDS) company in 1989. However, according to information that the company will not confirm, ZDS is today behind the majority of the reported loss and finds itself, with scarcely a new product range on the market, facing a price war unleashed by its competitor Compaq. A large order from the U.S. Air Force for supplying 300,000 PCs caused headlines lasting several months. After ZDS had won the contract in September of last year, three months later a U.S. government agency nullified the contract because of protests by market competitors. According to how things stand most recently, it appears that ZDS can now post for itself at least a part of the $724-million order.

Observers are proceeding on the assumption that Bull will focus on the following core areas in the future: the DCM (Distributed Computing Model) open system architecture, the UNIX platforms and Zenith Data Systems. But the service division above all, which accounts for 33 percent of sales today, is to grow to 40 percent in the next few years. An internal "facilities management" division has just been created.

However, where the company will find the money for its survival remains an open question. Deep in debt (Fr12 billion), Bull is dependent on donations of capital from outside. Very reluctantly the EC Commission approved government injections of capital to the tune of a total of Fr4 billion in 1991 and 1992. In order not to land itself in new trouble with the EC, the just replaced French government thought of a special form of financing. The French government and the public company France Telecom are granting Bull a credit of more than Fr2.5 billion with a term of three months. At the expiration of this term this credit can be converted into equity participation. Thus the new Balladur government is inheriting the problem—and the to-be-expected conflict with the EC Commission because of government subsidies. With a debt service bill of Fr1.3 billion and only Fr375 million in total equity it is clear already now that the next injection of money will be due already in a few months.

UK: Bayer's Restructuring Effort Detailed

93WS0439R Toddington NEW MATERIALS INTERNATIONAL in English Feb 93 p 7

[Text] Bayer's plastics, rubber and polyurethane businesses have been regrouped as the Polymers division.

In this division also are the Rhein Chemie rubber chemicals and additives group and the Wolff Walsrode group which markets cellulose derivatives, and flexible films for packaging and technical applications.

The restructuring involved 20 redundancies among the 1,200 employees, half at the Newbury headquarters.

All business activities will be coordinated and led by director Ray Kaufman, the current director and a past director of the UK polyurethane and rubber business groups respectively.

The move is part of a reorganisation of the company's 17 different business groups operating in the UK.

According to Lennart Aberg, managing director, Bayer plc, the restructuring will ensure greater customer-orientation and an improved competitive edge, at a time when customer demands and competition have been ever increasing.

The reorganisation also creates a new technical division under director John Walker, based at Bromsgrove, where Bayer plc has a latex manufacturing plant and national distribution warehouses on an 80-acre site.

Bayer, together with other UK group companies Miles and Agfa, operate 12 sites in the UK, and the technical division's specialists will coordinate all Health and Safety matters.

British Adhesives Maker Increases European Market Share

93WS0439S Toddington NEW MATERIALS INTERNATIONAL in English Feb 93 p 8

[Text] In the wake of the devaluation of sterling, Evode Ltd, the leading UK manufacturer of specialised industrial adhesives, claims it is increasing its share of the European market for automotive industry adhesives.

Evode supplies specialised hot melt, water borne and solvented adhesives to a large number of component manufacturers for the automotive industry.

The adhesives are used in many sub-assembly operations for car cabin interior fixtures and fittings. These include fascia and dashboard fittings, carpets, door trim and headlinings.

Several leading European component manufacturers supplying major automotive OEMs now see UK suppliers as an economic and high quality alternative to local sources within the European market.

This is having a direct consequence on the supply of appropriate adhesives from Evode whose business volume in this sector is growing steadily.

Evode Industrial Adhesives marketing manager Richard Harris said: "Our investment and commitment to the automotive industry is now helping us to develop a growing market share both in the UK and elsewhere in Europe. Not only is our European business increasing but UK suppliers also see us as a highly competitive supplier of high quality materials."

"We are confident that the business we are now developing will in large measure prove to be sustainable and continue in growth."

Germany: BASF Closes Polystyrene Plant

93WS0439T Toddington NEW MATERIALS INTERNATIONAL in English Feb 93 p 8

[Text] This month BASF Aktiengesellschaft is closing its polystyrene production plant in Ludwigshafen, Germany, reducing capacities by 90,000 tonnes a year. BASF currently has polystyrene capacities in Western Europe of 605,000 tonnes a year, including 360,000 tonnes in Ludwigshafen.

The plant's shuddering is due to the drop in demand for standard plastics, as well as the recent turbulence in the currency markets, which have resulted in a marked fall in prices. Furthermore, the general economic outlook for 1993 shows no signs of improving.

Employees affected by this move will be transferred to other positions within the company.

To improve profitability, BASF will shortly increase its prices for polystyrene brands by around 30 per cent. This move will not, however, boost proceeds from sales, which will remain well below those for 1991.

France: SGS-Thomson, NS Fuzzy Logic Systems Compared

BR1005145593 Paris ELECTRONIQUE INTERNATIONAL HEBDO in French 22 Apr 93 p 21

[Article by Francoise Grosvalet: "NS and SGS-Thomson Take Their First Fuzzy Steps"]

[Text] Both National Semiconductor [NS] and SGS-Thomson have chosen a software and not a circuit approach so that users can quickly develop fuzzy logic programs. This is the first time that NS is offering a product that combines neural and fuzzy logic technologies to simplify the work of designers.

After Togai Infra Logic, Aptronix, Inform, Neuralogix, and Omron, among others, NS and SGS-Thomson have just simultaneously announced fuzzy logic development tools adapted to their families of 8-bit microcontrollers (COP800 for NS and ST6 for SGS-Thomson). Both these software approaches, compared to the hardware approaches developed by Neuralogix or Tokai, for example, aim to speed up the development of fuzzy logic applications using standard, and therefore in theory less expensive, microcontrollers available on the market.

The approach chosen by SGS-Thomson is relatively traditional. It is the result of cooperation with the German company Inform, a European fuzzy logic specialist. NS's approach is much less so. The American company decided to combine fuzzy logic and neural network technology and to design a software development package adapted to this concept operating on a PC under Windows, to simplify the work of systems designers even further.

This approach is currently being examined by SGS-Thomson with its other European partners (Thomson DOI, TEM, and Inform) within the framework of a EUREKA (European innovative technologies program) project which is undergoing approval by the European authorities. Both companies have similar approaches for the future. They have both planned in the very short-term to introduce development systems adapted to other microcontrollers within their product ranges (particularly 16-bit models) to meet applications requirements for which 8-bit devices are not powerful enough (the automobile sector, for example). In the longer term, toward the end of 1994 or beginning of 1995 for SGS-Thomson, they will develop dedicated fuzzy logic controllers either in the form of a coprocessor, a separate processor, or one that can be integrated as a cell in a multipurpose microcontroller device.

In the meantime, NS is planning to integrate the most frequently used fuzzy logic microcodes in the ROM [read-only memory] of certain of its microcontrollers

(somewhat like Inform did for its 16-bit 80C166 microcontroller). NS is also developing a neural controller which could simplify the system's learning phase and even offer self-instruction.

Automatic Generation of a Compilation Code for the ST6

The most original feature of SGS-Thomson's approach with the fuzzy development software of the Tech ST6 Explorer Edition lies in its graphic interface inherent in Inform's development system: "One of the best on the market," says Jean-Yves Larignon, head of the microcontroller development tools department of SGS-Thomson's Programmable Products Division. The system uses subset-affiliation rules and functions defined by the systems designer based on his knowledge of the application. These allow it to generate a compilation code which can be directly processed by 8-bit microcontrollers of the ST6 range. This compilation code leads to a minimization of the program memory size used for the fuzzy logic subprogram. According to J.Y. Larignon, another advantage of SGS-Thomson's solution lies in the optimization functions for the high-performance rules. These three characteristics of Inform's system influenced SGS-Thomson to choose the German company as its partner in fuzzy logic two years ago. The French-Italian company said that two fuzzy logic applications using an ST62 8-bit microcontroller are already being used in washing machines and battery chargers. SGS-Thomson's approach seems suitable for applications in electrical household appliances (washing machines, vacuum cleaners, coffee machines, etc.) and engine and air conditioning controls. These are applications for which the software approach is perfectly suitable, and probably so for a long time to come. Indeed, if Emdad Khan, father of neural fuzzy logic at NS, is to be believed, only real-time applications will require the hardware-integrated fuzzy logic approach.

Neural Network To Generate Affiliation Rules and Functions

NS is essentially aiming at the same applications as SGS-Thomson with its NeuFuz software, whose originality lies in its use of neural network (software) for the definition of subset affiliation rules and functions. This approach opens up a whole range of applications in the fields of speech or object recognition as well as keyboardless computers.

The NS NeuFuz software is the first to be able to directly generate fuzzy logic rules and to convert them into affiliation functions for microcontroller applications based on the system's input/output data files. In this way, users seeking to develop customized fuzzy logic programs only have to define the input and output of their systems, whereas in the more traditional fuzzy logic approaches such as the one used by SGS-Thomson, they must define the fuzzy logic rules and affiliation functions themselves. In the NS approach, the NeuFuz software takes care of all this but, says J.Y. Larignon, "some knowledge of the system is necessary to optimize the rules and above all to define the weight coefficients of the neural network." This is why NS is developing, with a view to its introduction in the second half of 1994, an automatic data generation system directly usable by NeuFuz. NeuFuz can also verify and optimize the affiliation rules and functions before converting them into assembly codes usable by an 8-bit microcontroller of NS's COP8 range (a version providing the C code is also planned for the end of the year). The user can also initialize the neural network on the basis of previous knowledge which speeds up the operation of the neural network and contributes to reducing the development cycle time.

Both the NeuFuz system and the Fuzzy Tech ST6 Explorer Edition are currently limited to fuzzy logic applications with a maximum of four input channels and one output channel (and seven rules for SGS-Thomson), but that is not a major problem says Laurent Perier, director of microcontroller marketing at SGS-Thomson: "Most applications currently need no more than two or three input channels; one, or sometimes two, output channels; and between five and 10 rules." NS has nonetheless planned to introduce, before the end of the year, systems with six or eight input channels and multiple output channels to meet all requirements.

The two systems are different not only in the chosen approaches. Prices are also different: The SGS-Thomson system (also marketed by Inform) is sold at $395, while that of NS ranges from $500 (for the evaluation alone, but with the programming module and a programmable COP800) to $10,000 for the full development system; a simplified development kit is also available at $3,900.

France: Nuclear Fuels Production Company Weathering Economic Difficulties

93WS0447B Paris LE MONDE in French 23 Apr 93 p 18

[Article by A. K.: "Despite Several Exterior Handicaps, COGEMA Nets 507 Million Francs Profit"]

[Text] With a net profit of 507 million French francs [Fr] at the group level, for a consolidated revenue of Fr22.6 billion, COGEMA [General Nuclear Materials Company] of the CEA [Atomic Energy Commission] group weathered the year 1992 rather well, despite a very unfavorable economic situation. Its revenue increased 4 percent (and 0.7 percent within a "constant operating perimeter"; that is, essentially including its acquisition of Pechiney's nuclear activities). The company's current operating result showed a marked improvement, from a loss of Fr351 million in 1991 to a profit of Fr617 million in 1992. Comparatively, however, in constant terms of reference, its overall net result is down 70 percent from that of 1991, in that, the 1991 result included an exceptional profit of Fr1.76 billion stemming from the settlement of the Franco-Iranian controversy.

COGEMA produces nuclear fuel, encompassing the cycle from extraction of the uranium to the reprocessing of the used fuels. It has had to overcome several handicaps: The low price of oil, which reduces the competitiveness of nuclear fuel, and the low price of the dollar, which raises the price of French products in the franc zone; the weak economic growth, which is not conducive to the consumption of electricity; and the virtual stagnation of the nuclear market. In addition, the competition from the Eastern countries has driven down the price of uranium: "Massive exports" are being made "from the ex-USSR at prices so far below the real production costs of the Western world's best operations that neither the quality of the deposits nor the efficiency of operations can justify them," says COGEMA's chief executive officer, Jean Syrota, angrily.

To cope with this situation, COGEMA has continued to nationalize its activities. Its staff of 16,725 persons has increased slightly in absolute terms, but in constant terms of reference it has shrunk. The takeover, jointly with Framatome, of Pechiney's nuclear activities has also contributed to the company's streamlining objective, says Mr Syrota. And COGEMA's presence in all phases of the fuel cycle, has enabled the company to compensate for the drop in mining activity by a rise in the field of reprocessing, which accounts for 37 percent of COGEMA's revenue.

Mr. Syrota, however, views this swinging of the pendulum as nothing more than a temporary condition. His conviction that the price of uranium will recover—in an unspecified future—has led him to acquire 70 percent of the German firm Urangesellschaft, which has mining projects in Northern Canada's exceptionally rich uranium deposits.

Alcatel, Siemens Strategies for Supplying U.S. Market Reviewed

93WS0447C Paris LE MONDE in French 27 Apr 93 p 21

[Article by C. M.: "In U.S.-vs-EEC Telecommunications Controversy, Alcatel and Siemens Not Expected To Suffer From Possible American Sanctions"]

[Text] Indignant, though not really affected, threatened with exclusion from government telecommunications markets in the United States (LE MONDE, 22 April), the two European giants of the sector—France's Alcatel and Germany's Siemens—are not really upset. The sanctions the American government might possibly impose should not seriously affect them.

Alcatel and Siemens are sheltered. At least for the short term. The U.S. government markets represent only a very small part—a generally estimated 6 percent—of the U.S. telecommunications capital equipment markets. Neither of the two big EEC groups is responding to the current calls for bids. The French group has opted to concentrate on the U.S. private-sector market alone and to limit its interest to cables and transmission facilities. "It is a strategic choice. The sale of exchanges designed for the public networks in the United States is a difficult and costly market venture. For reasons of billing, profitability is more delayed there than elsewhere. In Europe, the system is billed in its entirety upon installation. The Americans, on the other hand, settle the billing for the exchange immediately, but pay for the software over a period of several years," says Alcatel.

Germany's Siemens, for its part, sells public switching equipment in the United States. Its estimated 6 percent of that market ranks it a distant third, behind ATT (50 percent) and Northern Telecom (40 percent), among the suppliers of that market. Even though Siemens cannot hope to equal its U.S. and Canadian rivals, its transatlantic position is nevertheless crucial. According to the IDATE Institute, the United States represents Siemens's second biggest public switching market after Germany. Nevertheless, its activities are not threatened. Siemens's clients are the local telephone companies. Its contracts are therefore not subject to U.S. government contracting procedures.

France: Aeronautics Industry Official Calls Industry Pre-1995 Prospects Poor

93WS0447D Paris LE MONDE in French 29 Apr 93 p 17

[Article: "Henri Martre: Aeronautics Industry Will Not Recover 'Before 1995'"]

[Text] The French aeronautics and space industry is suffering from three ills: The world economic crisis; the deregulation of the air transport industry, which is playing havoc with the accounts of the airline companies; and the East-West detente, which is diminishing military and space budgets. Henri Martre, president of the GIFAS [French Aeronautical and Space Industries Group], has disclosed a decline in consolidated revenue, consisting of a 4 percent drop in volume, and a 1.5 percent drop in value from Fr105.5 billion in 1991 to Fr101.4 billion in 1992.

This is the first time in 30 years that the revenue of the GIFAS's 200 member enterprises has declined in value. And the end of the tunnel is not yet in sight. Henri Martre sees "no end to the crisis before 1995" for the sector as a whole. The prospects for 1993 and 1994 are very bleak. The industry expects a further drop of some 10 percent in revenue for the sector, and possibly even a 20 percent drop for the engine manufacturers. In terms of jobs, the decline (-7 percent) is also significant. The number of persons employed by the industry has fallen from 118,300 in 1991 to 111,600 in 1992. "Some overmanning will result from short-time employment measures," said Henri Martre, but in due time, the number of employees will be further reduced to between some 102,000 to 103,000 persons.

Semiconductor Production Costs in EC Analyzed

BR1105122393 Paris ELECTRONIQUE INTERNATIONAL HEBDO in French 29 Apr 93 pp 18-19

[Article by Didier Girault: "Semiconductor Manufacturing Costs Higher in Europe"]

[Text] According to a study carried out by the European Electronic Components Manufacturers Association (EECA), the manufacturing cost of semiconductors is between 10 and 30 percent higher in Europe than in other regions of the world.

Producing semiconductors in Europe costs 10 to 15 percent more than in the United States or Japan and 30 percent more than in one of the "Four Dragons" (South Korea, Singapore, Taiwan, and Hong Kong).

In Europe the extra costs are not due to poor management, obsolete equipment, or less efficient production methods. A recently published EECA report concluded that "50 percent of the extra costs (of production in Europe) are linked to labor costs, 20 percent to interest rates and depreciation regulations, and more than 20 percent to raw material and supply prices." Labor costs are higher in Europe than in other regions of the world because, on the one hand, according to official statistics European working hours are shorter (and the real situation is said to be worse still), while on the other hand, social security costs are higher in Europe than elsewhere.

European Manufacturers Uncompetitive in Their Home Market

The EECA study of semiconductor manufacturing costs in Europe reiterated that the European semiconductor industry accounted for just 10 percent of world production and met only 50 percent of European demand.

The study was completed during the summer of 1992 under EECA direction and carried out by experts from Philips, SGS-Thomson, and Siemens. The exchange rates used were $1 to ECU0.73 (approximately 4.85 French francs [Fr]) and ¥126. However, the authors stated that they were "more interested in structural factors, which explains why no mention was made of the effects of exchange rate fluctuations on trade." The view maintained was that, in the long term, exchange rate fluctuations would not affect the conclusions of the study. In practice they calculated the manufacturing prices of three widely used CMOS [complementary metal oxide semiconductor] circuits: 1-Mbit DRAMs [dynamic random-access memory], 8-bit microcontrollers, and a 5,000-gate gate array circuit. For each of these circuits, the authors identified the irreducible costs imposed on the manufacturer by the plant's geographical location. All the other cost factors were defined as being "world best standard," i.e., the standard achieved by a hypothetical top-range, fault-free production unit.

The study showed that the production in Europe of 1-Mbit CMOS DRAMs costs 10 percent more than in the United States and 16 percent more than in Japan; that the production in Europe of 8-bit CMOS microcontrollers (80C51 type) costs 8 percent more than in the United States and 15 percent more than in Japan; and that the production in Europe of 5,000-gate gate arrays costs 8 percent more than in the United States and 33 percent more than in Southeast Asia. If the transfer of assembly and final testing activities to Southeast Asia is taken into account, the disparities persist, but are smaller for diffusion and electrical testing: for 1-Mbit DRAMs, Europe is 10 percent more expensive than the United States and 16 percent more expensive than Japan; for 80C51 microcontrollers, Europe is 8 percent more expensive than the United States and 12 percent more expensive than Japan; and for 5,000-gate gate arrays, Europe is 7 percent more expensive than the United States and 22 percent more expensive than Southeast Asia.

In conclusion, the EECA stated that political solutions had to be found to problems which are essentially social and cultural.

[Box] Production Efficiency is Key Cost Factor

The EECA study of semiconductor manufacturing costs in Europe calls for three comments. First, as the authors pointed out, exchange rates fluctuate and benefit (or disadvantage) various parts of the world in turn. Second, the circuits surveyed are widely distributed and therefore have a low reject rate and high production efficiency, which is not the case of more complex circuits (which have an efficiency of 60-70 percent). In this case, efficiency becomes the key factor in calculating the manufacturing cost. Third, the study does not mention "the organizational stages going from production start-up through to delivery," nor the overall cost reductions achieved through rigorous management methods (stock control). These factors explain, for example, why Motorola's Toulouse plant is judged as the group's most productive one for analog circuits.

Table 1. Production Cost of an 80C51 Microcontroller in a 40-Pin DIL[1] Package for a Production Output of 5,000 Units per Week

	Europe	United States	Japan
Diffusion			
Number of employees	287	242	231
Investments ($ million)	224.5	214.7	208.7
Unit cost ($)	0.224	0.208	0.2
Sorting			
Number of employees	76	64	60
Investments ($ million)	57.1	54.4	52.8
Unit cost ($)	0.04	0.036	0.035
Assembly			
Number of employees	502	421	399
Investments ($ million)	69.8	66.7	64.9
Unit cost ($)	0.33	0.305	0.285
Final testing			
Number of employees	247	206	196
Investments ($ million)	61.0	58.2	56.5
Unit cost ($)	0.058	0.052	0.049
Total			
Number of employees	1,112	933	886
Investments ($ million)	412.3	394.0	382.8
Unit cost ($)	0.652	0.602	0.568

DIL: dual-in-line

[Caption] The EECA stated that political solutions had to be found to problems which are essentially social and cultural.

Source: EECA

Table 2. Semiconductor Production Cost Ratios Between Different Geographical Areas

	80C51 Microcontrollers		1-Mbit DRAM's		5,000-Gate Gate Arrays	
	Europe/U.S.	Europe/Japan	Europe/U.S.	Europe/Japan	Europe/U.S.	Europe/Southeast Asia
Diffusion	1.08	1.12	1.10	1.16	1.07	1.21
Sorting	1.11	1.11	1.10	1.18	1.04	1.32
Assembly	1.08	1.16	1.09	1.15	1.08	1.32
Final test	1.12	1.18	1.09	1.15	1.11	1.94
Total	1.08	1.15	1.10	1.16	1.08	1.33

[Caption] For the diffusion and electrical testing of 5,000- gate gate array circuits alone, Europe is 7 percent more expensive than the United States and 22 percent more expensive than Southeast Asia. For the production of 1-Mbit DRAMs, European production cost is 10 percent higher than in the United States and 16 percent higher than in Japan.

Source: EECA

Table 3. Reference Values Applied Throughout the Study

	1-Mbit DRAMs	80C51 microcontrollers	5,000-gate gate arrays
Technologies	CMOS	CMOS	CMOS
Line width (microns)	1	0.8	1.2
Number of masks	16	12	12
Silicon wafer diameter (mm)	150	150	150
Chip surface (mm ^{2})	35	9.3	27.6
Number of silicon wafer produced per week	5,000	5,000	5,000
Weeks worked per year	50	50	50
Working days per week	6	6	7
Hours worked per day	24	24	24
Diffusion efficiency (%)	95	95	95
Electrical efficiency (%)	95	87	95
Assembly efficiency (%)	99	99	99
Final test efficiency (%)	95	97	97
Depreciation (in years):			
—Equipment	6	6	6
—Buildings	25	25	25
—Internal facilities	10	10	10

According to the experts, exchange rate fluctuations do not affect the report's conclusions in the long term.

Table 4. Differences in Semiconductor Manufacturing Environments

	Europe	U.S.	Japan	Southeast Asia
No. of hours worked (1 year)				
—Operators	1,460	1,750	1,850	1,800
—Controllers	1,460	1,750	1,850	1,800
—Managers/engineers	1,610	1,850	1,900	1,900
Hourly cost of work (ratio with base 1)	1.0	0.84	0.75	0.23
Cost of social security (percentage of labor costs)	40	30	20	27
Investment cost (ratio)				
—Equipment	1.0	0.97	0.92	0.95
—Buildings/facilities	1.0	0.97	0.95	0.97
Material costs (ratio)				
—Silicon wafers, masks	1.0	0.97	0.94	0.97
—Back-end packaging	1.0	0.97	0.93	0.93
Spare parts cost (ratio)	1.0	0.8	0.8	1.1
Service cost (ratio)	1.0	0.8	0.7	1.1
Energy cost (ratio)	1.0	0.8	1.0	1.08
Supplies cost (ratio)	1.0	0.95	0.9	1.1

According to the EECA, approximately 50 percent of the extra production cost in Europe is linked to labor costs, 20 percent to interest rates and depreciation regulations, and 20 percent to prices of raw materials and supplies.

Source: EECA

Netherlands: Fokker Adopts 3D Aircraft Design Technology

BR1205102993 Rijswijk POLYTECHNISCH TIJDSCHRIFT ELEKTRONIKA/ELEKTROTECHNIEK (INDUSTRIAL AUTOMATION insert) in Dutch Apr 93 pp IA 8-10

[Unattributed article: "Three-Dimensional Designs Unleash Revolution in Aviation Industry—Economic Climate Unfavorable for Major Investment"]

[Text] "Three-dimensional [3D] design means a revolution in aircraft design." There is no room for doubt about this in the mind of Fokker's Philibert Beekman. "Although it is difficult to quote factual data in an uncertain market, I expect us to have changed over completely from 2D to 3D design within five years." He believes the technological know-how acquired by Daimler-Benz in 3D design, especially in the context of Airbus, will be highly significant.

For some time now, Fokker has been digitizing the main industrial process in key areas. In addition to the design division, the aircraft and training divisions are also being digitized. Philibert Beekman, deputy director of Information Systems at Fokker, is the man responsible for implementing this major change. In this respect he is directly responsible to the company's Board of Directors.

Beekman is an industrial engineer who went straight from college to work for Krekel, Van de Woerd & Wouterse, a firm of corporate consultants. "I was fresh out of college and felt that my capacities as a consultant were not being used to the full." Things were obviously different at Fokker: "Obviously, because I have now been here for 13 years."

Design

An airplane is like a jigsaw puzzle with more than 100,000 pieces. It is an extremely laborious business making sure that they all fit together properly. The traditional way is to produce a drawing of every element—including frontal, side, and top elevations. Designers are there to perform the arduous task of monitoring the entire process from a mountain of drawings. Scale models of the aircraft parts being designed are produced to help them. Three-dimensional design is a world apart. Beekman is quite categorical about it: "If the drawing as the basic design medium is replaced with a computer file containing the 3D design, the designers have to think and work together in a different way. You need different tools and a different organizational structure."

A technical drawing provides detailed information about a limited area. A 3D computer model contains considerably more information; it contains not only detailed data, but also an overall picture. "Slowly but surely, everyone is waking up to the advantages of this design method." Beekman firmly believes that "the aircraft industry as a whole is switching to 3D."

Since designers can view not just the details but also the entire picture, it is easier to envisage how the thousands of individual pieces fit together. "If we design a radome using 3D," says Beekman, "it is easy to see where the recesses have to be located so that no other aircraft components are in the way of the radar waves."

In the electronics industry, 3D design has produced some ingenious snap connections. Beekman claims that these will also become significant in aircraft design.

Changeover

Having 3D design enables better cooperation. Different engineers in different disciplines can work simultaneously on the same design. This parallel or "concurrent" engineering has two advantages which Beekman says are essential to Fokker: "It makes the design process more manageable and therefore leads to shorter throughput times. Also, the quality of a 3D design is better. A higher percentage of designs are right the first time. This means fewer teething troubles when new aircraft types are developed and produced."

At present, approximately 100 of the 1,000 designers have changed over from 2D to 3D design. So, if the advantages are so obvious, why has Fokker not switched entirely to 3D design? "There are also financial implications. The uncertain state of the market means that the climate is not right for the major investments required," sighs Fokker's deputy director. "Moreover, Fokker's current models are all documented in 2D, so the only time to make the changeover is when work is started on a new model. Finally, the design process has to be organized differently, working practices have to be changed, and so on. It is a gradual process."

Since a computer file replaces paper drawings in 3D design, product models can be electronically interchanged. Fokker and its suppliers could begin the electronic interchange of product models, similar to the electronic trade data interchange (EDI) system at the port of Rotterdam and in the automotive and electronics industries. "The term usually used is PDI [product data interchange]," says Beekman. For the moment, this type of electronic interchange takes place only with DASA [German Aerospace] and, to a limited extent, with Short in Northern Ireland. "It takes a lot of time, energy, and money to get this type of electronic interchange off the ground."

Germany

Fokker already has several years' experience of operational collaboration with DASA. Their designers enjoy frequent, intensive contact. According to Beekman, "German know-how is at a high level. In the context of the Airbus project and military contracts, for example, they have a amassed a lot of experience in 3D design. However, there are major cultural differences in the day-to-day activities of engineers when it comes to discussing technical matters. When someone from Fokker is delegated to discuss a technical matter, he is authorized to make decisions. That is not normal practice in German business circles, where an extremely

complex ratification process swings into action, with everything having to be initialed, right up to the top of the company."

So, what does the DASA takeover mean in practical terms for the engineers and their way of working? Beekman says that from a technical point of view, there are no limits. "In theory, collaboration takes place according to the "arm's length" standard, which stipulates that subsidiaries work together as if there were no special links between them. However, there are no limits regarding the exchange of know-how and experience." For example, Fokker recently evaluated CASE (computer-aided software engineering) software packages. These are tools for partially automating the time-consuming software development process. Fokker conducted thorough experiments with CASE and concluded that it was not beneficial enough to the user. "We had a little look behind the scenes at DASA. They do use CASE and told us about their experience with it, but we were not pressured into using it ourselves."

Beekman stresses that a clear distinction has to be made between the ownership ratio—DASA's 51-percent shareholding—and operational collaboration. As a matter of fact, the two companies have been collaborating for much longer. He does not expect the new ownership ratio to result in strict regulations suddenly being issued from Germany and affecting, say, the use of particular software or equipment. "But together, we will be able to negotiate better purchasing conditions with suppliers. Obviously, in the long term, there is some pressure for uniformity," said Deputy Director Beekman.

Multimedia

Fokker is also digitizing aircraft maintenance. The "Aircraft Maintenance Manual" for the Fokker 100 is a volume comprising roughly 20,000 pages and 7,000 illustrations. The basis for the manual is a database which can be used to consult maintenance instructions, produce printouts, make alterations, and so forth. Also, maintenance engineers can obtain very detailed information about service activities and the most logical sequence for those activities. In addition, the electronic documentation can be uploaded into the customer's maintenance information system. American Airlines was the first Fokker customer to use this digital manual.

Fokker is one of the larger training institutes in the Netherlands. Over the years, more than 10,000 engineers have been trained to maintain Fokker aircraft. American Airlines alone has already trained more than 3,000 engineers [in Fokker maintenance procedures]. The students have to devote several weeks to learning all there is to know about the various Fokker aircraft.

Of course, the ideal situation would be to give all student pilots an airplane and let them learn to fly it. All the student maintenance engineers could then simultaneously learn to maintain the aircraft, and both groups of students would be learning at the same time.

"That type of approach would be ideal, as well as prohibitively expensive," says Piet van der Stam, manager of Fokker's Information Center. Van der Stam acts as technical consultant for a multimedia training program. The training includes roughly six weeks of conventional classes, a visit to the production line, use of the simulator, and around 30 hours of computer-based training. To make this part of the course more realistic, aircraft manufacturer Fokker has added video clips, animation, and video with voice-over instructions to the computer course on maintaining the Fokker 100. A project team of 10 people spent over a year preparing the course, which lasts 30 hours.

Remedy

"Collaboration" is the aircraft industry's remedy in times of uncertainty. The costs of designing and producing aircraft are becoming so high that they are almost beyond the means of individual firms. However, the efficient (i.e., digital) exchange of information is essential for good collaboration. Which is why Fokker is so interested in 3D design, electronic manuals, and computer-based training. "Otherwise, we would be sidelined."

[Box] Decentralization

Every week, the manager of Fokker's components factory at Schiphol [airport] receives a clear summary with key figures on the performance of his plant via an executive information system. "Three years ago this type of system would have developed by the central Automation department, using conventional development tools and terminals. Now, it is produced by a decentralized department using standard components whenever possible. It is manageable, reliable, and easy to maintain."

The motto for the decentralization of systems development at Fokker is "Effectiveness first, efficiency second." Beekman explains: "Much of the conventional automation was working well, but unfortunately not doing what the users wanted. Decentralization was begun to ensure that practical solutions are found to real problems."

Since then, automation issues are being handled at the division level and the necessary resources have been transferred, including both money and employees with automation experience. Decentralization has affected both the style of leadership ("I no longer issue any decrees") and the responsibilities of division managers. For example, the head of the design department can prioritize the changeover from 2D to 3D design at his department, and thus influence the overall process.

European Aerospace Industry Council Formed

93WS0471D Paris AFP SCIENCES in French 22 Apr 93 pp 7, 8

[Article: "Creation of a European Space Industry Council"

[Text] Paris—The AECMA [European Association of Aerospace Equipment Manufacturers] announced, on 19 April, that the leading European aeronautics and space

industrialists have formed a European Aerospace Industry Council to defend their sector's strategic interests and coordinate the activity of existing organizations.

The industrialists are currently represented by the AECMA, which encompasses the professional associations of nine European countries (the EEC less its non-producer member countries—Luxembourg, Greece, Ireland, Portugal—plus Sweden). Within it, the giants rub elbows with many small equipment manufacturers and subcontractors.

According to one of its representatives in Paris, the Association remains within the Community research programs, as do also the specialized IMG groups. The new Council, however, is "positioned above the AECMA," thus translating the "desire of the big enterprises for greater involvement in representation of the profession on a European scale."

"The creation of this Council signifies that the leaders of the European aerospace industry mean to ensure that the voice of this strategically important industry is clearly heard," said the president of the AECMA, who has been co-opted to head the new structure. The Council also plans to be a valid contact point in relation to the Community's institutions at the highest level.

For the moment, according to reliable sources, the Council consists of 13 members: the presidents of nine European groups—France's Aerospatiale, Dassault, and SNECMA; the United Kingdom's British Aerospace and Rolls-Royce; Germany's DASA; Italy's Alenia; Spain's CASA; and the Netherlands's Fokker—plus the president of AECMA and its three vice presidents. A representative of the equipment manufacturers may join the Council in the very near future, as may also a representative of Sweden's Saab.

The new Council is expected to meet approximately twice a year. After a founding meeting, scheduled for March 1993 (in connection with the presentation of the A-321 at Hamburg), its next meeting is expected to take place some time during the summer.

EAST-WEST RELATIONS

French-Russian Cooperation on Hyperfrequency Technology Assessed

93WS0382A Paris INDUSTRIES ET TECHNIQUES in French 5 Mar 93 p 32

[Article by Ridha Loukil: "Russian Electronic Know-How Is Available"; first paragraph is INDUSTRIES ET TECHNIQUES lead]

[Text] Electrodynamics, which has a potential of 3,000 researchers, looks outward to cooperation with Western companies.

For the third consecutive year, the Russians, in Paris to advertize their expertise at the Hyper, were one of the great curiosities of this hyperfrequency component and instrumentation show. Their company, Electrodynamics, which specializes in optronics, lasers, and hyperfrequencies, represents a tremendous technical reservoir for Western firms. Out of a total 50,000 employees, almost 3,000 are researchers, devoted exclusively to military applications only three years ago. Today, they are prepared to collaborate with Western partners on projects of mutual interest. Forced to look outward, the Russians are learning about competition as they gradually move into consumer products. French manufacturers daring enough to work with them are discovering unsuspected electronic know-how. "Western companies now have access to what are the results of high-level research, jealously accumulated for the former USSR's military requirements," according to Jean-Mathieu Stricker, R&D engineer at Info Realite, Electrodynamics's leading Western partner. This French research and development firm, which specializes in electronics, telecommunications, and publishing, has been working with Electrodynamics for three years. It was quick to seize the opportunity by entrusting some 10 projects to the Russian firm in three years. Thomson-CSF is following in its footsteps. Electrodynamics currently has around 10 contacts through its agent in France, Hersco, which distributes its products and canvasses French firms. However, these contacts will take a while to produce results. "Future partners start by ordering samples before requesting a preliminary study and then proposing a development contract," according to Vladimir Dzugayev, general director of Electrodynamics, which currently has a dozen Western partners, all European.

The Russians' technological lead, quality work, and quick turnaround times have won Info Realite over—not to mention their charges, which are very attractive for Western firms. "We supply them with the technical specifications and the components. We set them very short deadlines, which they meet," says Jean-Mathieu Stricker, citing the example of a radio receiver for radio messaging systems, which the Russians took from the specifications to the industrial prototype in just eight months.

"For each joint project, we select a team from among our best researchers and engineers that will devote itself exclusively to the project," Dzugayev says. Instead of our four or five people, they have a bigger team fully committed to the project, the Info Realite engineer confirms. He is impressed by the Russians' lead in R&D, despite the lag he has noted in mass production during his visits to Electrodynamics, near Moscow.

In their partnerships with the Russians, Western companies are discovering another approach to designing more compact but simple electronic systems. "In France, when we want to miniaturize, we do it the easy way by opting for integrated circuits. In contrast, the Russians look at integration only after they have exhausted the potential of discreet circuits, which are the basis of electronics," Jean-Mathieu Stricker says. One example of this technical proficiency is Bestar, a new signal amplifier for satellite transmission ground stations that will soon be distributed in France through Hersco. Because of its compactness and simplicity, it offers 50,000 hours of

trouble-free operation, which, Electrodynamics claims, makes it better than the most sophisticated American equivalent.

[Box]

Some Current Joint Projects

- Development of a radio messaging system with Info Realite. A chance for the Russians to branch out into consumer electronics.
- Computation of printed circuit discontinuity and development of a new avalanche diode for Thomson-CSF.
- Development of a 1 W 140 GHz microwave source for Germany's Erlanger University, near Nuremberg. Erlanger University is the Russians' biggest customer in terms of contract value.

French-Polish Plant Biology Center Opens

93WS0399B Paris AFP SCIENCES in French 1 Apr 93 pp 35, 36

[Text] Warsaw—The general director of the National Center for Scientific Research (CNRS), Francois Kourilsky, and the secretary of Poland's Scientific Research Committee (KBN), Jan Krzysztof Frackowiak, inaugurated the Franco-Polish Plant Biotechnology Center (CFPB) in Warsaw on 25 March.

"It is the first associate laboratory the CNRS has set up in eastern Europe," said Mr. Kourilsky. "I would like to stress its exemplary nature, for we are signing an agreement after leaving the initiative to researchers. This success is proof that science is done in laboratories and not in offices."

Indeed, the center for basic research in plant biology and molecular genetics is an offshoot of a successful sister program set up in 1991. The program has already produced several gene discoveries and numerous publications. On the Polish side, sister program participants included the Warsaw Institute of Biochemistry and Biophysics, the university's genetics department, and the Poznan Organic Chemistry Institute. The French side was represented by the CNRS's Gif-sur-Yvette Molecular Genetics Center, the Jacques Monod Institute, the genetics department of Pierre and Marie Curie University, and the Plant Research Institute of the University of Paris-Sud-Orsay.

The Polish government has invested $15 million in the new Franco-Polish institute, which has moved into brand new, very well-equipped quarters that boast high-security isotope labs, a synthesizer, a nucleic acid sequencer, ultracentrifuges, a 37° C room for yeast and plants, and so on. The CNRS provides an annual subsidy of Fr300,000, in addition to funding for salaried positions.

The sister program has already enabled the Biochemistry Institute run by Professor W. Zagorsky to expand and retain researchers tempted to relocate abroad. The Institute, which maintains close ties with the University of Warsaw, has also pursued a policy of hosting researchers from Eastern Europe and the former USSR, especially the Ukraine.

"The creation of this center, which is based on several years of real collaboration—17 Polish researchers came to France in 1992—establishes a strong link with Poland and a CNRS beachhead in Eastern Europe," declared Mr. Kourilsky. "The center could, in fact, serve as a model for advancing and shoring up scientific collaboration between west and east European countries."

The CNRS had signed a researcher-exchange agreement with the Polish academy as early as 1968. France renewed the accord in 1991, and since the breakup of the USSR, Poland has become the CNRS's top partner in Eastern Europe. Moreover, a new scientific and technical collaboration agreement was signed on the 25th, when Mr. Kourilsky made his visit.

The new Center has many scientific topics on its agenda. They include research into the structure and expression of genes, to explore plant resistance to herbicides and pathogenic agents; improving the organic qualities of plants; research into how plants "communicate" with their hosts; flora protection; the selection of genotypes suited to agriculture; plant molecular virology; and the sequencing of the yeast genome. Other Franco-Polish sister programs are also planned in astrophysics, physics, and carbon chemistry.

Polish Research

Four years after the economic and political reforms that have rocked Poland's communist society, Polish research is beginning its own "revolution" by changing funding procedures and limiting the prerogatives of the omnipotent Academy of Sciences.

Indeed, the Academy, which is gradually losing its powers, but which still has a representative in the Council of Ministers, was considered the flower of research under the former regime. Modeled after the Soviet system, it was at once a scientific society, state research organization (now encompassing 77 institutes), and the only organization to orient and finance research. But if the nature of research organizations has not yet changed fundamentally, their financing has—a great deal—thanks to the creation of the KBN (Komitet Badan Naukowych) in January, 1991.

The KBN is the supreme science and technology policy body, and finances or co-finances all Polish research institutes. It also evaluates their results, whether they are university-, ministry-, or academy-based—a huge first in this country. The KBN's president is elected by the Diete (parliament); five of its members are appointed by the prime minister and 12 are chosen by the scientific community.

"We began classifying institutes from A to D, depending on their work, discoveries, and publications, in 1991. The most dynamic of them (25 percent are categorized

A) receive state money," explains Jan Krzysztof Frackowiak, secretary of the KBN. "They get less and less when they are classified B or C, and none at all—not even for personnel salaries—when they fall into category D. At that point, they have only one choice: die, or find their own financing through industry or state contracts. This has enabled Poland to rid itself of a certain number of its 260 ministry institutes—unproductive "monsters" that excelled in unappliable applied research!"

The KBN has opted for project-by-project financing and allocates grants to researchers or researcher groups. Thus, of 9,600 projects submitted in 1991, the KBN underwrote only 2,400. "The problem with this assessment by individual or institute is that Poland has no comprehensive research programs or projects," regretfully notes Professor Piotr Slonimski, the "patron" of all genome research in France, a professor at Paris-VI, and one of the "creators" of the Franco-Polish Biotechnology Center.

"If Polish research wants to modernize," adds Mr. Slonimski, "it must also collaborate with foreigners. One hundred and fifty inter-government agreements have already been signed, with eastern and western European countries, but also with China, South Korea, or India. Researchers must also choose topics of international interest, that fit into world programs, and must be resourceful by "swapping" their experimental techniques and ideas for equipment or rare chemicals."

Thanks to a long tradition of research in mathematics, theoretical physics, molecular biology, and neurophysiology, "the scientific level of researchers is very good, and to conserve that potential, a Polish Repatriation Fund has recently been established to avert a brain drain." Those who have left for training abroad are thus assured, upon their return, of a job in a university or institute.

After making stringent assessments, the KBN will shortly submit a bill to the parliament recommending the closure of about 30 percent of research institutes. "It may be tough to get the decision passed," admits Mr. Frackowiak, "but it is a necessary decision in a country where research is almost exclusively public and budget constraints are enormous." Moreover, the CNRS, which has extensive experience in scientific evaluations, was consulted on the matter.

Digital Communications Link Between Denmark and Russia

93WS0441A Chichester INTERNATIONAL TELECOMMUNICATIONS INTELLIGENCE in English 12 Apr 93 p 1

[Text] The first digital fibre-optic submarine cable link to Russia was inaugurated on April 10th with a videoconference between Boris Yeltsin in Moscow and Denmark's Prime Minister Poul Nyrup Rasmussen in Copenhagen.

The project to install the cable system was initiated by Telecom Denmark and GN Great Northern Telegraph Company in cooperation with A/O Intertelecom, Russia's international telecoms operator.

The 1,210 km submarine cable has a capacity for 15,360 simultaneous telephone calls. The cable has landing points in Koge Bay, south of Copenhagen, and Kingisepp in Russia, close to the Estonia border. The contract to supply and install the cable was awarded to STC Submarine Systems of the UK.

The project also included a 65 km land cable and 140 Mbit/s microwave links from Kingisepp to St. Petersburg (124 km) and from St. Petersburg to Moscow (810 km). The microwave equipment was supplied by NEC of Japan under a turnkey contract awarded to Sumitomo.

The complete system, which can carry voice, fax, data and image transmissions, has direct access to the international telecommunications network via Telecom Denmark's earth station in Albertslund, just outside Copenhagen.

In Russia, international calling capacity has been doubled with the installation of three new international gateway switches which entered service on the same day as the Denmark-Russia fibre-optic cable link (see under Russia, this section).

The cost of establishing the submarine cable and radio relay system runs to almost US$95 million. Besides Telecom Denmark and Intertelecom, more than 20 international telecom operators from all over the world have helped to finance the system by purchasing capacity on the system in advance.

Further details of the project were covered in ITI Issues 308, 330, 353, 355, 359 & 360.

Telecom Denmark, GN Great Northern and Intertelecom are also working together on other projects. The two Danish companies are at present studying the feasibility of extending the digital microwave system from Moscow to Khabarovak in the far eastern region of Russia—a distance of about 8,000 km (see ITI Issues 349, 360 & 374).

In addition, Telecom Denmark and GN Great Nordic will help Intertelecom build the Russian portion of a new digital submarine cable that will connect Russia, Japan and Korea in the Sea of Japan (see ITI Issue 349). This cable will replace the present Russian-Japanese cable that was built in 1969 with the help of GN Great Nordic.

France's Alcatel Acquires Polish Telecom Companies

93WS0455A Chichester INTERNATIONAL TELECOMMUNICATIONS INTELLIGENCE in English 26 Apr 93 p 3

[Text] Alcatel's Spanish subsidiary, Alcatel Standard Electrica, recently bought controlling stakes in the two Polish telecommunications companies, PZT Telcom S.A. and Teletra S.A., with a view to manufacturing advanced switching and transmission products for the Polish market.

Alcatel said the investments under the agreement amount to US$46.6 million for a controlling interest in the two companies (reported to be 80 per cent), plus US$25 million as capital increase and additional investment commitments over the next six years to upgrade the companies for the production of Alcatel 1000 S-12 digital exchange systems which are already present in the Polish market. Alcatel says it also foresees the creation of an important software centre, which will take advantage of the high level attained by Polish engineers in this field.

Based in Warsaw, Telcom is a manufacturer of long-distance transmission equipment for the public network and is one of the largest telecommunications installation companies in Poland. The company employs some 640 people.

Teletra, based in Poznan, is one of the main producers of communication equipment for the public network in Poland, and employs some 1,300 people.

Teletra is also a partner in another Alcatel joint-venture in Poland called Alcatel CIT Polska. Established in 1990, the venture was set up to manufacture Alcatel's E10 public exchanges. Other partners included Eltra and Elektrim (see ITI Issue 268). Alcatel also operates through another joint-venture in Poland called Alcatel Setel.

Under the terms of this latest agreement, Alcatel is believed to have committed to maintain employment levels at 1,650 workers over the next 18 months and to invest some US$10 million in employee training.

Alcatel claims its share of the Polish telecommunications market is 70 per cent and says it has orders for a total of 1.4 million lines, 450,000 of which are in service.

According to the Polish Ministry of Communications, the Polish market is expected to expand by 600,000 lines a year to provide an estimated 25 telephones per 100 residents in the year 2000, up from 8.7 per 100 in 1989.

Hungary, Netherlands Sign S&T Cooperation Agreements

93WS0455I Zoetermeer SCIENCE POLICY in English Apr 93 p 23

[Text] Two agreements have been signed by the Netherlands and Hungary establishing cooperation between the two countries in education, research, and technology. Dutch education and science minister Jo Ritzen, Hungarian minister for education and culture Dr. Andrasfalfy, and Hungarian minister for research and science policy Prof. Pungor agreed to earmark over three million guilders for cooperation in research and technology and one million guilders for education over the next five years.

As regards research, the cooperation established by this agreement will concentrate on the quality of scientific and technological research, knowledge transfer to the business community and a sound structure for the training of researchers. Projects are being implemented by research organisations and institutes in both countries. Coordination is in the hands of the Hungarian National Committee for Technological Development and the Dutch Ministry of Education and Science.

Of the three million guilders pledged by Minister Ritzen for technological and scientific cooperation, just over half will be in the hands of the Netherlands Organisation for Scientific Research (NWO), which will use it to set up cooperative projects in Hungary. The emphasis will be on mathematics, information technology, housing, epidemiology, immunology, and solid-state physics.

In addition, the Royal Netherlands Academy of Arts and Sciences (KNAW) will have 650,000 guilders to spend on cooperation in social sciences, linguistics, and life sciences. The Netherlands Organisation for Applied Scientific Research (TNO) will receive 600,000 guilders to conduct research with Hungarian institutes into the environment, biotechnology, and new materials. The Dutch EC liaison bureau in The Hague is investigating the possibility of EC funds for Dutch-Hungarian research into energy, biotechnology, and agriculture. And the Associations of Netherlands Universities (VSNU) will advise on improving the quality of teaching and the training of researchers in Hungarian universities.

In spring 1993, Hungarian research minister Prof. Pungor intends to organise a conference in Budapest on increasing the benefits of scientific and technological research for the Hungarian business community. Pungor also wants to invite Dutch scientific and technological researchers to this conference, together with representatives of the Dutch business community. The conference will be a follow-up to the recent OECD analysis of the Hungarian business community's potential for innovation.

EC Assumes Responsibility for Safety of Russian PWR Plants

BR1905152393 Rijswijk POLYTECHNISCH WEEKBLAD in Dutch 30 Apr 93 p 3

[Unattributed article: "Netherlands 'Adopts' Reactors in Russia To Ensure Greater Safety"]

[Text] The Netherlands, together with Belgium, Italy and Spain, is to assume responsibility for the safety of two nuclear power stations in the former Soviet Union. The "adoption" plan involves PWR [pressurized water reactor] plants, as opposed to the "Chernobyl-type" power stations. The European Community is footing the bill.

Improved equipment (hardware and measuring equipment), stricter safety requirements, and more highly trained reactor staff are the three most important aspects of the aid program for the safety of Russian reactors, which is to be undertaken by the Netherlands Quality Control Institute for Electrical Materials and Appliances (KEMA), the Netherlands Energy Research Center (ECN), the Nucon engineering consultancy, and the Joint Nuclear Power Stations Authority (GKN). GKN owns the Dodewaard power station.

Low Risks

"The adoption plan is based on a pragmatic point of view," says Dr. H. Arnold, director of GKN. "It is better to use your money to improve unsafe power stations in Eastern Europe than to reduce the low risks of Western power stations by just a few percent." Arnold believes that it should be possible to achieve an "acceptable" level of safety at the two Russian nuclear power stations over a period of two to two and a half years. The idea is for Russian reactor staff to come to the Netherlands for training and counselling about Western reactors and their safety procedures. One of the power stations which has been "adopted" is in Kalinin, north of Moscow. The second reactor has not yet been selected. Possible candidates are the Kola power station near Murmansk or a reactor in the Ukraine.

The Netherlands partners are hoping to be able to get started in July. They will begin by working with the Russians on a list of requirements, before actually taking any action. "Not all their technology is obsolete," says Arnold. "Their operators are probably better at improvising than we are in the West, because they have limited resources."

Arnold says that the notorious RBMK 1000 reactors, i.e., the Chernobyl-type ones, are outside the scope of the aid program because the West has no experience with such reactors. This year, the EC is providing ECU40 million, roughly equivalent to 87.6 million guilders.

EUROPE-ASIA RELATIONS

Italy: Italtel Signs Telecommunications Accord in China

MI1105131193 Milan NOTIZIE ITALTEL in Italian Mar 93 p 15

[Text] Italtel has consolidated its presence in China. The Italian telecommunications company has signed an important accord with the CNTIC [China National Technical Import Corporation] in Shanghai, in the presence of representatives from the Chinese Post and Telecommunications Ministry, and leading municipal authorities. The accord concerns the supply of an advanced telecommunications network in Pudong, a new industrial area and commercial city. The contract is worth more than 100 billion lire and in view of the funding aspect, falls under the framework of existing economic cooperation between Italy and China. Italtel will be the main contractor group of Italian companies that includes Alcatel for the supply of Optimux numerical optical fiber transmission equipment, cross-connect systems, the monitoring system for the entire network which will have a capacity of more than 380,000 terminations.

The presence of Italtel in China is particularly important and diversified. A factory producing telecommunications systems under an Italtel license entered into operation at Chongqing in 1988, and in 1991 the Chongqing Italtel Communication Equipment Limited was established for the production and sale of transmission systems.

The joint venture company has been assigned an order to supply transmission equipment for the 1,200-kilometer optical fiber network connection between the cities of Fuzhou and Guangzhou.

Italy: SGS-Thomson Transfers European Activities To Asian Firm

MI1105132793 Genoa GE.RI.CO. NEWS in Italian Mar 93 p 6

[Text] SGS-Thomson has stipulated a series of accords with the Asian company QPL for the sale of its plant in Maxeville, France and a majority shareholding in its UK companies in Newport and Duffryn. The agreement marks the opening of the first production line in Europe of silicon designed exclusively for the development of microelectronic devices for third parties. In the United Kingdom, QPL will control 70 percent of the company, which operates a four-inch diffusion line and testing lines there. In fact, the first client in the United Kingdom will be SGS-Thomson, which has already placed orders for devices for color graphics and transputers.

Germany: Deutsche Aerospace's Plans, Sales to China Noted

93WS0384A Duesseldorf HANDELSBLATT in German 1 Apr 93 p 11

[Article by S.Z.: "Air Traffic: Deutsche Aerospace Airbus Has Long-Range Plans in People's Republic; German Aircraft Industry Cannot Avoid Moving Production Plants"]

[Text] Beijing, HANDELSBLATT, Wednesday, 31 Mar 93—Deutsche Aerospace Airbus, Ltd., Hamburg, has long-range "plans and ideas" for an industrial commitment in the People's Republic of China. They are going to "talk it over" with the Chinese. The chief executive officer of Deutsche Aerospace Airbus, Hartmut Mehdorn, announced this during an interview with HANDELSBLATT in Beijing.

He said that one has to "industrially commit" oneself on a long-range basis in China since the Chinese are also looking for a transfer of technology. China's aircraft industry will "be successful," said Mehdorn, who also cited the example of McDonnell Douglas's Shanghai plant in which its MD-80's and MD-90's are being assembled. The European Airbus Industry consortium is already manufacturing parts in China, among others emergency exits and doors. Airbus's partner, Deutsche Aerospace, cannot escape from the trend toward moving to production plants to Asia and China either, although these plans are "not yet hard and fast" and are only in a preliminary phase.

Following a contract for supplying a dozen aircraft, additional sales options, and preliminary contracts worth billions, Deutsche Aerospace Airbus has suddenly become the most successful German consortium in China. Behind the deal is Beijing's current refusal to

enter into contracts with Airbus Industries, the parent company based in Toulouse, France. French companies are on the Beijing CAAC's blacklist because of the sale of Mirages to the Taiwanese Air Force. "If the French channel is blocked, we can use another one," Mehdorn said. For months he had hammered away at the CAAC with the argument that 63 percent of the Airbus consortium is not French.

Up to now, China's aircraft market was dominated by Boeing, which has already sold China over 100 jets, and McDonnell Douglas (with its own production plant in Shanghai). So far, 12 Airbuses are flying in China. Airbus has massively penetrated the Boeing market in the British crown colony of Hongkong with big contracts with Cathay Pacific Airways and Cathay subsidiary Dragon Air.

Mehdorn explained that his company has not only sold 12 A-300-600s to the regional Chinese companies, China Northwestern and China Northwest Airways, but has in addition agreed on contracts for a total of 10 aircraft as options with these airlines through the central aviation authority, the CAAC. Furthermore, options may be signed with China Southern Airways for supplying the latter with six A-340 long-range jets. As a result, they were able to book firm orders for and options to buy 28 Airbuses within a week.

Among the current "slightly modified" contracts with China, Deutsche Aeropsace Airbus appears as a supplier and, consequently, Germany as a deliverer of the aircraft. The financing of the Airbuses will behandled through commercial channels. Mehdorn said that the CAAC has its own financing sources and does not need any credit or leasing aid from Deutsche Aerospace Airbus for puchases. The regional airlines have already come up with down payments for some of the aircraft that have just been ordered. The prices of the Airbus 300-600 and Boeing's competing model, the Boeing 767, are the same.

Mehdorn emphasized that Minister of Economy Rexrodt, who ended his visit to China on Wednesday and flew back to Bonn, has not participated in the negotiations that have been going on since as early as spring of 1992, but that he has provided political backing. "With this order the Chinese thanked us for not having sold any submarines to Taiwan," Mehdorn surmised. Aimed at Boeing, the Airbus general manager explained: "That's just what the Americans do. Every U.S. ambassador is a salesman for Boeing."

The Deutsche Aeropspace Airbus sales package also includes assistance in training, spare parts deliveries, and cooperation on maintenance. Mehdorn sees an enormous growth market in the People's Republic of China. China's aviation industry is only at the beginning of a stormy development period. During the past year 700 out of 1,000 Americans, 600 out of 1,000 Europeans, and 30 out of 1,000 Russians bought a plane ticket. But only 10 out of 1,000 Chinese flew. We see quite clearly—also in view of China's gigantic population—where the market of the future lies."

Elf Atochem, China Sign New Joint-Venture Agreement

93WS0397D Paris COMPOSITES ET NOUVEAUX MATERIAUX in French 12 Mar 93 p 8

[Unattributed article: "Elf Atochem: First Industrial Plant in China"]

[Text] On 6 March 1993, at the China World Trade Center in Beijing, Elf Atochem and Beijin Chemical Industry Group Corp., BCIGC, signed a joint-venture agreement to produce plastic additives; the joint venture will be called Beijing Elf Atochem Polystab.

It will produce and market BCIGC's existing line of organotin compounds and the organotin compounds issued from Elf Atochem's technology. These additives, which are used as stabilizers in PVC [polyvinyl chloride], will be manufactured in a plant with a capacity of 3,000 metric tons per year, built according to Elf technology. The new company will be owned 60 percent by Elf Atochem and 40 percent by BCIGC. It will be operational in May 1993. The company will supply mostly the booming Chinese market for rigid and flexible PVC, and it will export to Asia.

Ciba Geigy, Nippon Paint Reduce Printed Circuit Size

93WS0444C Paris L'USINE NOUVELLE in French 8 Apr 93 p 25

[Article by Jean-Pierre Jolivet: "Ciba Geigy and Nippon Paint Launch Printed Circuit Etching Method Enabling Miniaturization Gains"]

[Text] *Etching can be done to even narrower widths without slowing production. What is more, it is fully automated.*

While chips and other surface-mounted electronic components vie with each other when it comes to miniaturization, the printed circuits to which they connect are still frequently the limiting factor in the generalization of these technologies. This obstacle is now in a fair way to being overcome. Ciba Geigy, together with Nippon Paint, is now proposing a method of etching printed circuits that produces metallic paths one-third the width of those produced by current conventional methods, enabling the narrowing of this width to 50 microns. And this without a sacrifice of yield, as in the case of methods involving the use of traditional heat-sealed dry films.

This new method, baptized Optimer, makes use of liquid photoresists (light-sensitive films that serve as photomasks during the transfer of the path pattern to the substrate) deposited by electrophoresis, by immersing the card in the aqueous solution of photosensitive resin, the anodic deposition of which lasts no more than 120 to 150 seconds for layers ranging between 5 and 15 microns in thickness.

Depending on the field of application, the photoresist can be negative (for the internal layers of the printed circuit) or positive (for the external layers). "The positive photoresist, which is destroyed by light during the insolation stage, has the advantage of protecting the interconnection holes," says Jean-Pierre Logel, who heads Technical Support in Ciba Geigy's Electronic Materials Department. Conventional methods require the use of inserts to protect the metallized holes during the chemical attack on the copper. This results in a loss of printed circuit area.

The method is particularly adapted to path widths of less than 120 microns. It attains yields of 90 percent for geometries between 70 and 75 microns. Its precision is explained by the exceeding thinness of the layer of resin deposited, which is one-fifth the thickness of dry films. The chemical attack on the copper is thus very much sharper. And the method requires only a single stage of metallization of the holes following their perforation, instead of the two stages required by conventional methods.

On the other hand, the Optimer method, which enables full automation of the production process (panel plating), will require that the manufacturers of printed circuits convert their production lines, which are still too sequential. The pressures of the marketplace will undoubtedly spur the European industrialists in this direction. In Japan, 70 percent of the production of printed circuits is done by panel plating.

Italy: Italian Space Agency To Build Ground Station in Singapore

MI1105130693 Rome SPAZIO INFORMAZIONI in Italian 7 Apr 93 p 2

[Text] Rome, 7 April (SPAZIO INFORMAZIONI)—The Italian Space Agency (ASI) has recently decided to construct a ground station in Singapore to receive the data that will be collected by the Italian SAX [Satellite for Astronomy and X-Rays] satellite. This was made known recently by ASI Director General Prof. Carlo Buongiorno who stated that the new station will complement the projected station to be situated at the San Marco equatorial launch site in Kenya managed by the La Sapienza University of Rome. According to the latest forecasts, SAX is slated for launch between the end of 1994 and early 1995 using the American Atlas carrier.

ESA, Japan To Collaborate on Space Robot

93WS0471C Paris AFP SCIENCES in French 22 Apr 93 p 7

[Article: "Japan, ESA To Collaborate in Field of Space Robots"]

[Text] Tokyo—Citing Japanese government sources, the daily YOMIURI has disclosed that Japan and the ESA [European Space Agency] are planning to cooperate in developing the technology of space robots, a technology that is currently dominated by the United States. An official announcement is expected to ensue from a Japan-ESA ministerial meeting scheduled for 1 June in Tokyo.

Their cooperation in the field of space robots will consist mainly of exchanges of information, but it is expected to enable Japan to participate in a series of ESA experiments over the next two or three years on a robot to be installed aboard an American space shuttle. The robot is to perform mainly simple maneuvers, such as pressing a switch and making minor repairs, in low gravity.

Japan, for its part, is working on an experimental recovery, by means of a space robot, of a micro-satellite that is to be jettisoned by the ETS-VII experimental satellite, scheduled to be launched in 1997.

France, PRC To Exchange Robotics Students

93WS0472C Paris AFP SCIENCES in French 22 Apr 93 p 14

[Unattributed article: "Data-Processing and Computer Integrated Manufacturing [CIM] Cooperation Agreement Between the Valenciennes and Shanghai Universities"]

[Text] Paris—The Shanghai Science and Technology University and the University of Valenciennes and Hainaut-Cambresis are going to cooperate and exchange students in the fields of CIM, computer-aided design and manufacturing (CAD/CAM), and data processing; an agreement to that effect was signed on 14 April.

Signed in Valenciennes by university presidents, Benyu Guo and Claude Tournier, the agreement will enrich the international cooperation network that the Data-Processing and CIM Engineering School (EIGIP) of the Valenciennes University has been setting up in recent years.

The network enables the school to send its students to the Montreal Higher School of Technology, the Moscow Bauman Study University, the Chongqing, Parma, Milan, and Twente (The Netherlands) universities, the Stockholm Royal College, and the Berlin and Inkerlan (Spain) Technology Transfer Institutes.

As far as research is concerned, the agreement involves the Industrial and Software Engineering Laboratory, an associate of the CNRS [National Center for Scientific Research], which is expected to become one of the poles of French technological research in the fields of automation and mechanics.

Under the agreement three or four French students will go to Shanghai, and as many Chinese will come to Valenciennes.

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